# PHASE II ENVIRONMENTAL SITE ASSESSMENT

VACANT RETAIL FILLING STATION PROPERTY
14030 STATE ROAD
NORTH ROYALTON, OHIO

SEPTEMBER 2013

PREPARED FOR:
CUYAHOGA COUNTY LAND
REUTILIZATION CORPORATION
323 LAKESIDE AVENUE WEST
SUITE 160
CLEVELAND, OHIO, 44113



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14030 STATE ROAD
NORTH ROYALTON, OHIO

PREPARED BY:

MATTHEW DANUS, PG ENVIRONMENTAL SCIENTIST

REVIEWED BY/APPROVED BY:

SALLY GLADWELL, CP SENIOR PROJECT MANAGER



# **EXECUTIVE SUMMARY**

The Mannik & Smith Group, Inc. (MSG) was retained by the Cuyahoga County Land Reutilization Corporation (CCLRC) to complete a Phase II Environmental Site Assessment (ESA) of a vacant retail filling station located at 14030 State Road, in North Royalton, Ohio (the Property). The purpose of this investigation was to obtain information related to the soil and groundwater quality underlying the Property and to potentially identify orphan USTs in the eastern portion of the Property. MSG understands that the CCLRC is working in partnership with the City of North Royalton, which may be interested in acquiring the Property for commercial redevelopment. Field activities including a Ground Penetrating Radar (GPR) survey, the installation of ten soil borings, and the installation of six groundwater monitoring wells were completed at the Property. The Phase II ESA scope of work was based on the findings of a Phase I ESA MSG completed for the CCLRC in April 2013 and Phase II Field Sampling and Analysis Plan (FSAP) prepared for the CCLRC in July 2013.

The Phase I ESA, which was completed in accordance with ASTM1527-05, identified two Recognized Environmental Conditions (RECs) in connection with the Property:

**REC-1** The Property has been used as a retail gasoline outlet from approximately the 1960s through 2006. During that period, the Property was occupied by one or more gas stations operating under the brand names of Gulf, Clark and AP. The long history of UST systems on the Property coupled with the unknown status of former UST systems and undetermined nature of petroleum releases at the Property that have apparently impacted soil and groundwater is considered a REC.

**REC-2** Records indicate that prior to 1970, the Gulf station operated an automotive repair shop with two garage bays. The historical automotive repair activities conducted at the Gulf station represent an REC in connection with the Property with regard to the use and possible release of petroleum products and/or solvents, and the undefined affects that these may have on soil and groundwater at the Property.

Based on the Phase II ESA field observations and the laboratory analytical results, MSG has made the following conclusions:

- 1. Three 10,000-gallon underground storage tanks (USTs) remain on the Property near the southwest corner. A GPR and magnetic locator survey was completed in the eastern portion of the Property, which did not identify anomalies indicative of additional USTs being present on the Property.
- 2. Based on the analytical soil data, no constituents of concern (COCs) were detected in soil above the Bureau of Underground Storage Tank Regulations (BUSTR) action levels or Ohio Voluntary Action Program (VAP) standards, except for the BUSTR soil to drinking water leaching action level and the Ohio VAP leach based soil values for benzene at two locations (MW-01 4-6' and B-07 4-6'). MSG recognizes that the CCLRC is not completing an Ohio VAP-compliant assessment of the Property; however, we compared the analytical results to VAP standards in the absence of a more suitable standard. The results indicate that the benzene concentrations in the soil could leach into and impact the groundwater. The building on the Property is connected to the public water supply and the groundwater at the Property is not used as a drinking water source. The two monitoring wells (MW-05 and MW-06) located downgradient of MW-01 and B-07 did not reveal concentrations of benzene in excess of the laboratory reporting limit. Given this, the benzene impacts appear to be localized near MW-01 and B-07. Additionally, because drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water, the elevated benzene concentrations are not anticipated to present a complete exposure pathway.
- 3. Based on the monitoring well gauging data, groundwater is flowing in a southern-southeastern direction across the Property. At only one location (MW-01), the benzene concentration exceeded the BUSTR

groundwater ingestion action level and Ohio VAP unrestricted potable use standard. As stated above, the benzene concentrations at monitoring wells MW-05 and MW-06 (downgradient of MW-01) did not detect benzene in excess of the laboratory reporting limit. Therefore, the elevated benzene concentration appears to be relatively isolated and contained within the Property limits. Furthermore, as stated above, the Property does not use groundwater as a drinking water source and drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water. Therefore, the elevated benzene concentration at MW-01 will likely not present a complete exposure pathway.

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## 1.0 INTRODUCTION

The Mannik & Smith Group, Inc. (MSG) was retained by the Cuyahoga County Land Reutilization Corporation (CCLRC) to complete a Phase II Environmental Site Assessment (ESA) of a vacant retail filling station located at 14030 State Road, in North Royalton, Ohio (the Property). A Property Location Map is presented on Figure 1. The purpose of this investigation was to obtain information related to the soil and groundwater quality underlying the Property and to potentially identify orphan USTs in the eastern portion of the Property.

# 1.1 Prior Environmental Investigations

MSG completed a Phase I ESA of the Property in April 2013 for the CCLRC. The Phase I ESA, which was completed in accordance with ASTM1527-05, identified two Recognized Environmental Conditions (RECs) in connection with the Property:

REC-1 The Property has been used as a retail gasoline outlet from approximately the 1960s through 2006. During that period, the Property was occupied by one or more gas stations operating under the brand names of Gulf, Clark and AP. The first documented USTs on the Property were associated with the Gulf station and were located near the southeastern corner of the Property and near the center of the Property. Records reviewed do not indicate whether or not these USTs were ever removed from the Property. A Clark station replaced the Gulf station in approximately 1970. During ownership by Clark, three 7,500gallon gasoline USTs were installed near the center of the Property. Clark also reportedly operated a kerosene UST located east of the retail building and later another kerosene UST was installed west of the retail building. A fire occurred at the Property in 1984 during which the dispenser pumps were destroyed. In 1988, fire department records indicate that the Clark station USTs were closed by removal from the ground and replaced by three 10,000-gallon USTs located near the southwest corner of the Property. A used oil UST was discovered near the center of the Property during dispenser upgrade activities in 1992. It is possible that the used oil UST was the centrally located UST that was reported to exist during the tenure when Gulf operated at the Property. Records indicate that remnant petroleum constituents in groundwater exceeded potable use standards in the 1990s. The long history of UST systems on the Property coupled with the unknown status of former UST systems and undetermined nature of petroleum releases at the Property that have apparently impacted soil and groundwater is considered a REC.

**REC-2** Records indicate that prior to 1970, the Gulf station operated an automotive repair shop with two garage bays. Typical features at an automotive repair facility may have included below grade hydraulic lifts and a below grade oil/water separator. The historical automotive repair activities conducted at the Gulf station represent an REC in connection with the Property with regard to the use and possible release of petroleum products and/or solvents, and the undefined affects that these may have on soil and groundwater at the Property.

# 1.2 Property Description

The Property is developed with one commercial building, a canopy over four fuel dispensers, and a small wooden shed. The Property is predominantly paved with asphalt or concrete except for small landscaped portions. Three 10,000-gallon gasoline USTs are located west of the Property building and four dispenser islands are located north of the building. According to the Bureau of Underground Storage Tank Regulations (BUSTR), these USTs are out of service. The Property building consists of a small retail area, a walk-in cooler, and restrooms.

The current Property building is vacant and has been so since approximately 2006. The building was historically used as a retail filling station. The most recent occupant of the Property was AP Store #1750. Prior to AP the Property was occupied by a Clark filling station from 1970 through the mid-1990s. Prior to 1970, Gulf occupied the Property with an automotive repair shop and retail filling station. The initial development of the Property as a Gulf station was not readily available, although city directories identified the Property address as being residential prior to the commercial development in the 1950s.

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# 2.0 METHODOLOGY

This section describes the field activities conducted by MSG field personnel. Field activities including a Ground Penetrating Radar (GPR) survey, the installation of ten soil borings, and the installation of six groundwater monitoring wells, all of which were completed at the Property.

# 2.1 Ground Penetrating Radar

On June 21, 2013, a GPR survey was performed by BehrGeo Environmental, LLC over the southeastern portion of the Property using a Mala Ramac X3M ground penetrating radar unit with a 500 MHz transducer/receiver antenna over a grid with an approximately five foot line spacing. The effective penetration depth of the GPR signal during this survey appeared to range from approximately three to five-feet below the ground surface over most of the area surveyed. There was no evidence of significant near-surface signal interference within the survey areas. No anomalies that were consistent with what would be produced by a UST were present in the survey area.

In conjunction with the GPR survey, a magnetic locator survey was completed at the Property. The magnetic locator survey was completed over the same area as the GPR survey. The survey was completed using a Schonstedt GA-52Cx Magnetic Locator on an approximately eight-foot to 10-foot line spacing. Traverses with the magnetic locator were completed in a north-south and an east-west direction over the survey area. No magnetic anomalies that were consistent with what would be produced by a UST were identified in the areas of the GPR survey. Magnetic interference was encountered within about five-feet of the existing building. Other than adjacent to the existing building, no other areas of significant signal interference were identified at the Property. Based upon the lack of GPR and magnetic locator anomalies, it does not appear that any USTs remain in the southeast portion of the Property. The GPR report is included in Appendix A.

# 2.2 Soil Sampling

On July 31, 2013, MSG advanced ten soil borings (MW-01 through MW-06 and B-07 through B-10) using Geoprobe direct push technologies. The boring locations are depicted on Figure 2. Soil borings were installed to a maximum depth of 32-feet below the ground surface (bgs). The drilling contractor collected soil samples continuously from the ground surface to the terminal depth of the borings using four-foot Geoprobe samplers. MSG obtained soil samples from the driller's sampling equipment at a minimum of two-foot intervals. Soil samples were examined, logged, and split, with one portion being placed in clean, glass jars provided by the laboratory and the other being placed in a plastic bag for screening by a geologist using a photoionization detector (PID). PID readings for each sample interval were recorded on individual soil boring logs. Jarred samples were placed in an iced cooler for storage during transport under proper chain-of-custody to the analytical laboratory. Appendix B contains the soil boring logs.

Soil samples were submitted for laboratory analysis based on PID screening results and/or field observations. Selected soil samples were analyzed, in accordance with the FSAP, for one or more of the following parameters: volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260; benzene, toluene, ethylbenzene, total xylenes, and methyl tert-butyl ether (BTEX/MTBE) by USEPA Method 8260; polynuclear aromatic hydrocarbons (PAHs) by USEPA Method 8270; polychlorinated biphenyls (PCBs) by USEPA Method 8082; and/or total petroleum hydrocarbons (TPH) C<sub>6</sub>-C<sub>12</sub>, C<sub>10</sub>-C<sub>20</sub>, C<sub>20</sub>-C<sub>34</sub> by EPA Method 8015.

After soil sampling activities were completed, the soil borings were either converted into groundwater monitoring wells or they were backfilled with a combination of soil cuttings and bentonite.

# 2.3 Groundwater Monitoring Well Installation

On July 31, and August 1, 2013, MSG converted six of the soil borings into permanent groundwater monitoring wells designated MW-01 though MW-06. The well locations are depicted on Figure 2. The monitoring wells extend to depths between 27 and 31-feet bgs. Each one-inch diameter monitoring well was installed using a Geoprobe. Well casings consisted of 1-inch polyvinylchloride (PVC) risers flush threaded to 10-foot sections of 0.01 inch slotted PVC screen with a pre-packed sand filter around the well screen. Additional sand was placed in the annular space around the screen and riser section of each well from the bottom of the well to two feet above top of screen and bentonite chips from two feet above the screen interval to one foot bgs. All of the monitoring wells were completed flush with existing grade in concrete. Monitoring well details are included in Appendix B.

# 2.4 Groundwater Monitoring Well Development and Sampling

The groundwater monitoring wells were developed in accordance with the Ohio EPA's Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring (TGM). Development of each well was completed using disposable bailers. The bailer was lowered into the monitoring well until contact with the water column. Insertion of the bailer forced water into the formation and the removal of the bailer containing groundwater allowed for the release of groundwater from the formation and well annulus (sand pack). Periodically, prior to removal from the monitoring well, a full bailer was removed and then allowed to sink in rapid motions along the entire length of the well intake to eliminate bridges that may have formed adjacent to the well intake. This method enhanced the removal of particulates accumulated at the bottom of the well. A peristaltic pump was also used to purge the wells prior to sampling. The purge water was monitored with a water quality meter to measure the pH, temperature, and specific conductance during development.

Sampling of the wells occurred at a minimum of 24 hours after monitoring well installation. In accordance with the TGM, groundwater sampling was completed using a peristaltic pump to purge and monitor the water quality parameters including pH, temperature, and specific conductance, which were measured with a Hanna meter. The pump was set to purge groundwater at an approximate rate of 150 to 200 milliliters per minute (mL/min). Once the water quality parameters stabilized, the conditions in the monitoring wells were assumed to be representative of actual groundwater conditions, a dedicated disposable bailer was used to obtain a grab groundwater sample from each well. All groundwater samples were placed in labeled laboratory-supplied sample containers and then, placed in an ice chest for preservation in the field. The analytical data including the completed chain of custodies are included in Appendix C. Groundwater samples were submitted for laboratory analysis and analyzed for one or more of the following parameters: VOCs by USEPA Method 8260; BTEX/MTBE by USEPA Method 8260; or PAHs by USEPA Method 8270.

## 2.5 Groundwater Gradient

Static groundwater levels were measured to the nearest 0.01 feet using a water level indicator at each monitoring well. Depth to groundwater measurements were recorded and used to determine groundwater flow direction. MSG surveyed the relative top of casing well elevations using differential leveling. Relative groundwater surface elevations were determined by calculating the difference between the depth to static groundwater from the top of each well casing. Table 1 summarizes the monitoring well gauging data and relative groundwater elevations. The groundwater gradient is south–southeast and is depicted on Figure 3.

# 2.6 Geological and Hydrogeological Conditions

The native stratigraphy of the Property encountered during soil boring advancement generally consisted of brown silty clay with varying amounts of sand, gravel, and shale fragments from approximately one foot bgs through 24-feet bgs. Gray, saturated sand was encountered at approximately 24 feet bgs. The depth to groundwater was approximately 24-feet bgs. Soil borings advanced within the former UST cavities encountered approximately eight to 12-feet of sand and gravel fill materials overlying the brown silty clay. Soil boring logs are included in Appendix B.

# 2.7 Quality Assurance/Quality Control

During the sampling of the soil and groundwater, MSG obtained quality assurance/quality control (QA/QC) samples to ensure the accuracy of the investigation. QA/QC samples included an equipment blank, a field blank, a duplicate sample, and a trip blank. The laboratory results of the QA/QC sampling did not identify potential cross-contamination.

# 3.0 <u>FINDINGS</u>

# 3.1 Comparative Standards

Although the Property has USTs on-site, this assessment was not conducted as part of corrective actions within the BUSTR guidelines. Additionally, the Property is not currently participating in Ohio's VAP. However, data generated during this assessment were compared against action levels developed by BUSTR under Ohio Revised Code (ORC) 3737.882(B) and standards promulgated under Ohio Administrative Code (OAC) 3745-300-08 of Ohio's Voluntary Action Program (VAP) in the absence of other suitable program cleanup standards for comparison. Property-specific details, such as property occupant or soil type, can influence which standards should be used to compare each chemical of concern (COC). For the purposes of this assessment, BUSTR's non-residential land use was used, based on the current and MSG's understanding of the intended future use of the Property for commercial purposes. Additionally, the default BUSTR soil class, which is soil Class 1 (coarse grained soils) was used for comparison. The commercial and industrial land use and the construction and excavation activities categories were used when comparing soil results with the Ohio VAP generic direct-contact standards.

BUSTR action levels used as comparative standards for this assessment included delineation levels for soil and groundwater, soil direct contact, soil to indoor air, soil to outdoor air, soil TPH saturation values, soil to drinking water leaching, groundwater ingestion, groundwater to indoor air; and groundwater to outdoor air.

Ohio VAP standards used as comparative standards for this assessment included generic direct-contact soil standards for commercial/industrial use category and construction/excavation activities category; leach based soil values; and groundwater generic unrestricted potable use standards.

## 3.2 Soil Results

Table 2 presents a summary of soil data. Laboratory analytical reports and chain of custody forms are included in Appendix C.

Soil analytical results indicate that concentrations of several VOCs consisting of benzene, toluene, ethylbenzene, or xylenes were detected above the laboratory reporting limit in soil samples from borings MW-01, B-07, B-08, or B-09. Additionally, n-butylbenzene, sec-butylbenzene, isopropylbenzene, p-isopropyltoluene, naphthalene, n-propylbenzene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, and 1,3,5-trimethylbenzene were detected above the laboratory reporting limit in the soil sample from boring B-09. The only VOC determined to exceed a comparative soil standard was benzene at MW-01 (4-6') and B-7 (4-6'), which exceeded the BUSTR soil leaching to drinking water action level and the Ohio VAP leach based soil value.

Soil analytical results indicate that naphthalene was the only PAH detected above the laboratory reporting limit in one sample from B-09. The naphthalene concentration at B-09 (6-8') did not exceed any of the comparative soil standards. PCBs were not detected above the laboratory reporting limits in any of the soil samples tested. The laboratory reporting limits were all below the comparison soil standards.

Lastly, concentrations of TPH C6-C12 and C10-C20 were detected above the laboratory reporting limit in soil samples from borings MW-01, B-07, B-08, or B-09. Concentrations of TPH C20-C34 were not detected above the laboratory reporting limit in any of the soil samples. None of the TPH concentrations exceeded the comparative soil standards.

# 3.3 Groundwater Results

Table 3 presents a summary of the groundwater analytical data. Laboratory analytical reports and chain of custody forms are included in Appendix C.

Groundwater analytical results indicate that concentrations of several VOCs consisting of BTEX and MTBE were detected above the laboratory reporting limit in groundwater samples from monitoring wells MW-01 and MW-04. The only VOC determined to exceed a comparative groundwater standard was benzene at MW-01, which exceeded the BUSTR Ingestion action level and the Ohio VAP unrestricted potable use standard.

Groundwater analytical results also indicate that pyrene and fluoranthene were the only PAHs detected above the laboratory reporting limit in the groundwater sample from monitoring well MW-05. The pyrene and fluoranthene concentrations at monitoring well MW-05 did not exceed any of the comparative groundwater standards.

# 4.0 <u>CONCLUSIONS</u>

MSG completed a Phase II ESA designed to assess potential impacts associated with the two RECs that were identified in MSG's Phase I ESA, dated April 2013. This Phase II assessment included a GPR survey, the installation of ten soil borings, and the conversion of six soil borings into permanent groundwater monitoring wells. Based on the field observations and the laboratory analytical results, MSG has made the following conclusions:

- Three 10,000-gallon USTs remain on the Property near the southwest corner. A GPR and magnetic locator survey was completed in the eastern portion of the Property, which did not identify anomalies indicative of additional USTs being present on the Property.
- 2. Based on the analytical soil data, no constituents of concern (COCs) were detected in soil above the BUSTR action levels or Ohio VAP standards, except for the BUSTR soil to drinking water leaching action level and the Ohio VAP leach based soil values for benzene at two locations (MW-01 4-6' and B-07 4-6'). MSG recognizes that the CCLRC is not completing an Ohio VAP-compliant assessment of the Property; however, we compared the analytical results to VAP standards in the absence of a more suitable standard. The results indicate that the benzene concentrations in the soil could leach into and impact the groundwater. The building on the Property is connected to the public water supply and the groundwater at the Property is not used as a drinking water source. The two monitoring wells (MW-05 and MW-06) located downgradient of MW-01 and B-07 did not reveal concentrations of benzene in excess of the laboratory reporting limit. Given this, the benzene impacts appear to be localized near MW-01 and B-07. Additionally, because drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water, the elevated benzene concentrations are not anticipated to present a complete exposure pathway.
- 3. Based on the monitoring well gauging data, groundwater is flowing in a southern-southeastern direction across the Property. At only one location (MW-01), the benzene concentration exceeded the BUSTR groundwater ingestion action level and Ohio VAP unrestricted potable use standard. As stated above, the benzene concentrations at monitoring wells MW-05 and MW-06 (downgradient of MW-01) did not detect benzene in excess of the laboratory reporting limit. Therefore, the elevated benzene concentration appears to be relatively isolated and contained within the Property limits. Furthermore, as stated above, the Property does not use groundwater as a drinking water source and drinking water is provided to the Property and the surrounding areas by the City of Cleveland Division of Water. Therefore, the elevated benzene concentration at MW-01 will likely not present a complete exposure pathway.

Table 1 Groundwater Gauging Data Summary 14030 State Road, North Royalton, Ohio

	Depth to	Depth to Bottom of	Relative Elevation of	Relative Elevation of	
Well ID	Groundwater (feet)*	Well (feet)	Top of Casing	Groundwater	Screen Interval (feet)
MW-01	14.05	27.53	101.92	87.87	18-28
MW-02	11.6	27.43	99.66	88.06	18-28
MW-03	13.52	27.23	101.315	87.80	18-28
MW-04	12.77	27.25	101.02	88.25	18-28
MW-05	14.56	26.73	101.825	87.27	17.3-27.3
MW-06	15.2	31.13	102.915	87.72	22-32

<sup>\*</sup> Depth to groundwater obtained on August 2, 2013

Table 2 Analytical Soil Data Summary 14030 State Road, North Royalton, Ohio

Sample Identification	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	B-07	B-08	B-09	B-10	Ohio VAP Commercial/ Industrial Generic	Ohio VAP Construction/ Excavation	Ohio VAP Leach	BUSTR Soil	BUSTR Soil Direct Contact Action	BUSTR Soil to Drinking Water	BUSTR Soil to Indoor Air Action	Maximum
Sample Depth (feet)	4-6	2-4	6-8	10-12	22-24	8-10	4-6	4-6	6-8	8-10	Direct Contact	Generic Direct	Based Soil Values	Delineation Levels	Level	Leaching Action Level	Level	Detected Values
Sample Date	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	7/31/2013	Standards	Contact Standards				Levei		
Volatile Organic Compou	nds (VOCs) U	SEPA Method	8260															
Benzene	0.41	< 0.0063	< 0.0065	< 0.0057	< 0.0057	<0.0058	0.39	0.018	< 0.0059	< 0.0059	140	150	0.017	1.04	100	0.149	1.04	0.41
Toluene	2.4	< 0.031	< 0.033	< 0.029	<0.028	< 0.029	< 0.3	< 0.031	< 0.03	< 0.03	520	520	6.8	61.3	5,900	49.1	61.3	2.4
Ethylbenzene	11	< 0.0063	< 0.0065	< 0.0057	< 0.0057	<0.0058	3.1	0.22	0.021	<0.0059	230	230	12	199	17,000	45.5	199	11
Xylenes	54	< 0.019	< 0.02	< 0.017	< 0.017	< 0.017	7.6	0.28	0.024	<0.018	370	370	156	15.7	6,400	469	15.7	54
Methyl tert-butyl ether	<0.24	< 0.0063	< 0.0065	< 0.0057	< 0.0057	<0.0058	<0.06	< 0.0062	< 0.0059	<0.0059	1,900	6,700	NS	1,240	57,000	0.47	1,240	
n-Butylbenzene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.051	NT	178	178	NS	NS	NS	NS	NS	0.051
Sec-Butylbenzene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.02	NT	764	764	NS	NS	NS	NS	NS	0.02
Isopropylbenzene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.015	NT	260	260	NS	NS	NS	NS	NS	0.015
p-Isopropyltoluene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.01	NT	573	573	NS	NS	NS	NS	NS	0.01
Naphthalene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.067	NT	150	84	0.27	54	530	39.8	54	0.067
n-Propylbenzene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.06	NT	236	236	NS	NS	NS	NS	NS	0.06
1,2,4-trimethylbenzene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.28	NT	120	35	NS	NS	NS	NS	NS	0.28
1,2,3-trimethylbenzene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.059	NT	NS	NS	NS	NS	NS	NS	NS	0.059
1,3,5-trimethylbenzene	NT	NT	< 0.0065	NT	< 0.0057	NT	NT	NT	0.031	NT	95	200	NS	NS	NS	NS	NS	0.031
All Other VOCs	NT	NT	ND	NT	ND	NT	NT	NT	ND	NT	NS	NS	NS	NS	NS	NS	NS	
Polynuclear Aromatic Hyd	drocarbons (P	AHs) USEPA I	Method 8270															
Naphthalene	NT	NT	< 0.043	NT	< 0.037	NT	NT	NT	0.38	NT	150	84	0.27	54	530	39.8	54	0.38
All other PAHs	NT	NT	ND	NT	ND	NT	NT	NT	ND	NT	NS	NS	NS	NS	NS	NS	NS	
Polychlorinated Biphenyl	s (PCBs) USE	PA Method 80	)82															
All PCBs	NT	NT	<0.022	NT	< 0.019	NT	NT	NT	<0.02	NT	18	42	NS	NS	NS	NS	NS	
Total Petroleum Hydrocar	bons (TPH) U	SEPA Method	I 8015M	•	•			•			•			•				
TPH C6-C12	24	< 0.63	< 0.65	< 0.57	< 0.57	<0.58	100	8.0	450	< 0.59	1,000	NS	NS	1,000	NS	NS	NS	450
TPH C10-C-20	45	<5.0	<5.2	<4.6	<4.5	<4.0	17	8.4	4.8	<4.7	2,000	NS	NS	2,000	NS	NS	NS	45
TPH C20-C34	<4.7	< 5.0	<5.2	<4.6	<4.5	<4.0	<4.8	<4.9	<4.7	<4.7	5,000	NS	NS	5,000	NS	NS	NS	

NT = not tested ND = not detected NS = no standard

BUSTR = Bureau of Underground Storage Tank Regulations

VAP = Ohio EPA Voluntary Action Program

Bold Values Exceed a Standard

All Value are reported in mg/kg

Table 3 Analytical Groundwater Data Summary 14030 State Road, North Royalton, Ohio

Sample Identification	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	Ohio VAP Unrestricted Potable	BUSTR Ingestion	BUSTR Groundwater to Indoor Air Action	Maximum Detected
Sample Date	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013	8/2/2013	Use Standard (UPUS)	Action Levels	Levels	Values
Volatile Organic Compound	s (VOCs) USEP	A Method 826	60							
Benzene	0.21	< 0.0005	< 0.001	< 0.0005	< 0.001	< 0.0005	0.005	0.005	26.8	0.21
Toluene	0.088	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.0	1.0	2510	0.088
Ethylbenzene	0.1	< 0.0005	< 0.001	< 0.0005	< 0.001	< 0.0005	0.7	0.7	6,180	0.1
Xylenes	0.38	< 0.0015	< 0.003	< 0.0015	< 0.003	< 0.0015	10	10	670	0.38
Methyl tert-butyl ether	0.025	< 0.001	< 0.001	0.0049	< 0.001	< 0.001	0.04	0.04	200,000	0.025
All other VOCs	NT	NT	ND	NT	ND	NT	NS	NS	NS	
Polynuclear Aromatic Hydro	obarbons (PAH:	s) USEPA Met	hod 8270							
Flouranthene	NT	NT	< 0.00005	NT	0.000069	NT	0.42	NS	NS	0.000069
Pyrene	NT	NT	< 0.00005	NT	0.00005	NT	0.47	NS	NS	0.00005
All other PAHs	NT	NT	ND	NT	ND	NT	NS	NS	NS	

NT = not tested

ND = not detected

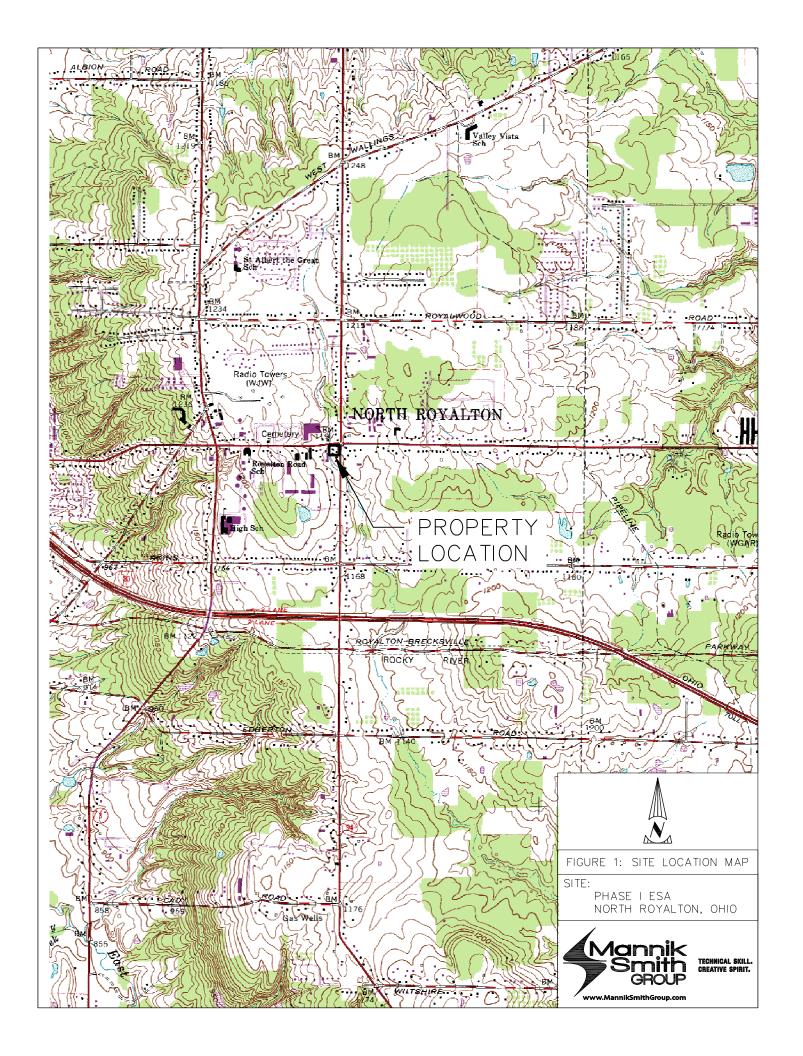
NS = no standard

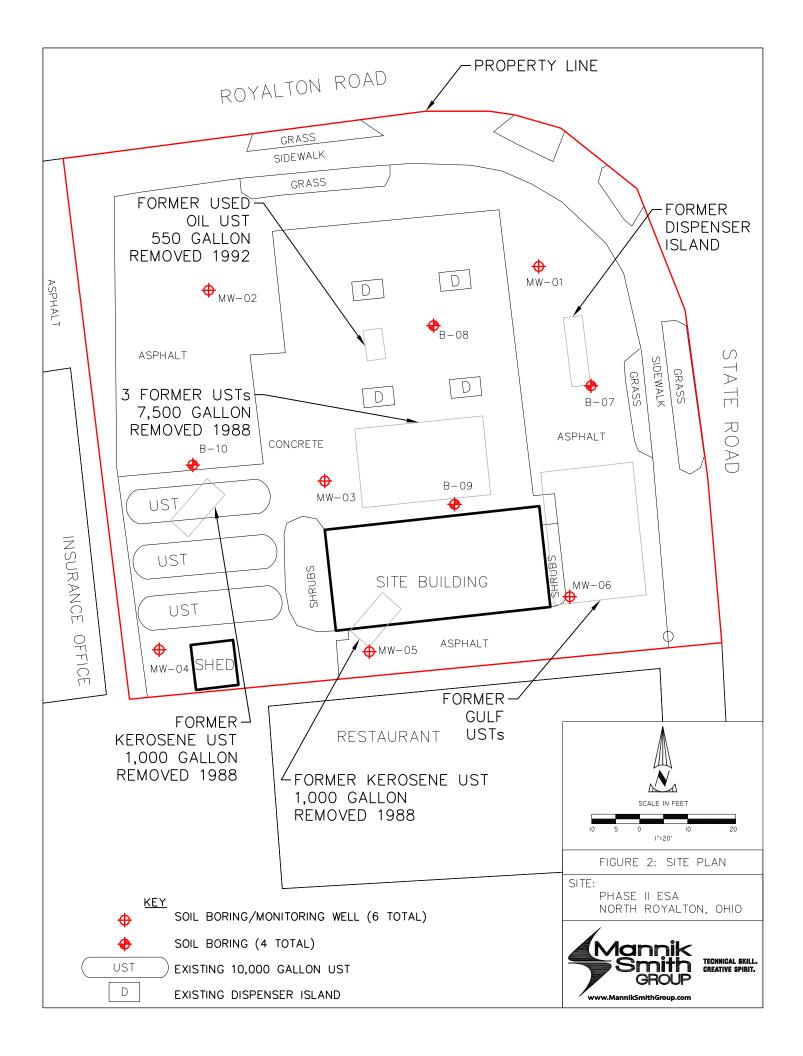
BUSTR = Bureau of Underground Storage Tank Regulations

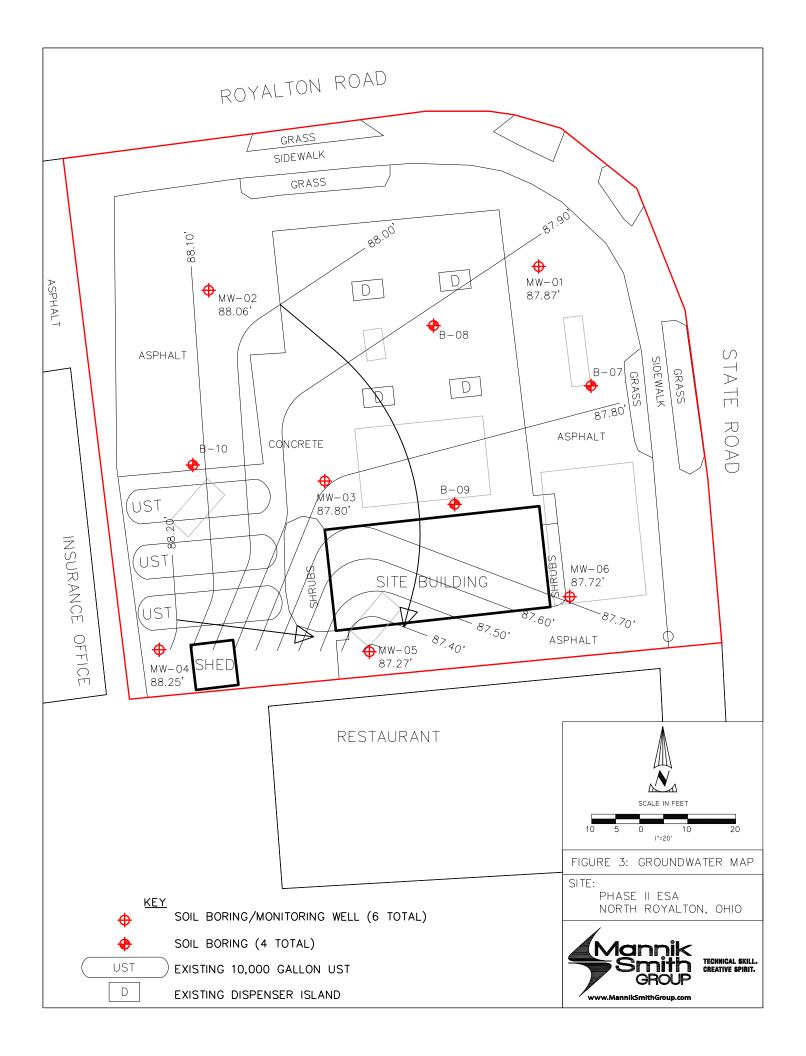
VAP = Ohio EPA Voluntary Action Program Bold Values Exceed a Standard

All Value are reported in mg/L

# **FIGURES**







# APPENDIX A GROUND PENETRATING RADAR REPORT





July 15, 2013 Behr130027

Mr. Matt Danus Mannik Smith Group 23225 Mercantile Road Beachwood, Ohio 44122

Re: Ground Penetrating Radar and Magnetic Locator Survey

Former Gasoline Service Station

14030 State Road North Royalton, Ohio

Dear Mr. Danus,

Behr Geo Environmental LLC (Behr) was retained by Mannik Smith Group (MSG) to complete ground penetrating radar (GPR) and magnetic locator surveys of a portion of the property located at 14030 State Road, North Royalton, Ohio (Subject Property).

Historical records indicate that there may have been one or more underground storage tanks (USTs) near the southeast corner of the Subject Property. MSG was reportedly unable to obtain records documenting the closure of any USTs from this portion of the Subject Property, therefore, it was suspected that USTs could remain.

This GPR and magnetic locator survey was performed to attempt to located USTs that may remain in the southeast portion of the Subject Property.

# **GPR Survey**

A GPR survey was performed over the area shown on **Figure 1** using a Mala Ramac X3M ground penetrating radar unit with a 500 MHz transducer/receiver antenna over a grid with an approximately 5-foot line spacing. The survey area was defined based upon information provided by MSG personnel and consisted of one approximately 30-ft by 60-ft mostly asphalt-paved area.

The effective penetration depth of the GPR signal during this survey appeared to range from approximately 3 to 5-feet below the ground surface over most of the area surveyed. There was no evidence of significant near-surface signal interference within the survey areas.

Mr. Matt Danus Mannik Smith Group July 15, 2013

No anomalies that were consistent with what would be produced by a UST were present in the survey area.

**Magnetic Locator Survey** 

In conjunction with the GPR survey, a magnetic locator survey was completed at the subject property. The magnetic locator survey was completed over the same area as the GPR survey shown on **Figure 1**. The survey was completed using a Schonstedt GA-52Cx Magnetic Locator on an approximately 8-foot to 10-foot line spacing. Traverses of the subject property with the magnetic locator were completed in a north-south and in an east-west direction over the survey area.

No magnetic anomalies that were consistent with what would be produced by a UST were identified in the areas of the GPR survey.

Magnetic interference was encountered within about 5-feet of the existing building. Other than adjacent to the existing building, there were no other areas of significant signal interference at the Subject Property.

**Conclusions** 

The GPR and magnetic locator surveys identified no anomalies consistent with what would be produced by a UST in the survey area. Based upon the lack of GPR and magnetic locator anomalies, it is Behr's opinion that no USTs are present within the survey area.

Closing

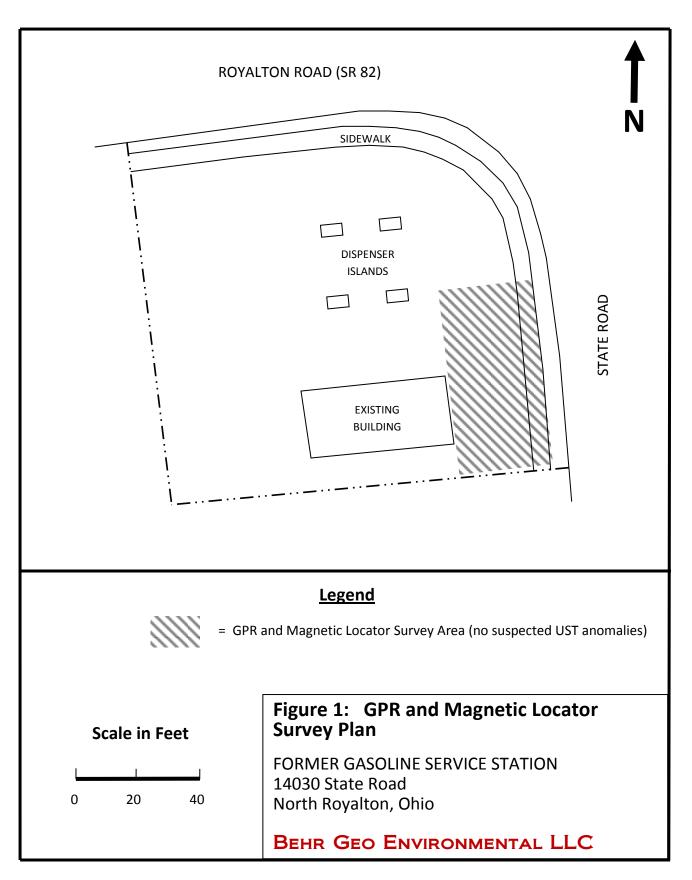
We appreciate the opportunity to work with you on this project. Please call Behr Geo Environmental LLC at 216-906-7752 if you have any questions or if we can be of further assistance.

Sincerely,

BEHR GEO ENVIRONMENTAL LLC

David W. Behringer, PG, CP

Owner



# APPENDIX B Soil Boring Logs & Well Construction Details





# **Soil Boring / Monitoring** Well Number: MW-01

Project Number: C3210006 Project Name: Phase II ESA

Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

**Contractor:** Envirocore **Driller:** Jake Bradley

Drilling Method: Géoprobe Continuous Sampling

Drill Rig: Geoprobe Total Depth: 28 feet

**MW Installation Date:** 8/1/2013

Northing: NA

Depth (ft)	Elev. (ft.)	Well Diagram	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Type	FID/PID (ppm)	Recovery (in.)	Remarks
		Casing Type: 1" PVC								
-		Concrete Pad			Ashpalt  Red Brick  Black, Gray Clay, Soft	1	DT	2.0	12	
					Brown Clay with Gray Mottling	2	DT	14.8	12	
5_		PVC Riser				3	DT	109.5	20	Submitted to Lab
		Bentonite				4	DT	78.3	20	
10_		Chips				5	DT	41.3	24	
-						6	DT	18.6	24	
					Gray Clay with some Brown Clay	7	DT	0.4	24	
15_					Brown Clay with Shale Fragments	8	DT	1.3	24	
-		Sand				9	DT	0.3	24	
20_		Sallu				10	DT	0.3	24	
-						11	DT	0.3	18	
		Slotted Pre- Packed Screen			Gray Sand with Large Shale Fragments, Moist	12	DT	0.0	18	
25_					Gray Sand, Moist	13	DT	0.0	17	
					Gray Sand, Wet	14	DT	0.0	17	
30		·			End of Soil Boring = 28 feet					



# **Soil Boring / Monitoring** Well Number: MW-02

Project Number: C3210006 Project Name: Phase II ESA

Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

**Contractor:** Envirocore **Driller:** Jake Bradley

Drilling Method: Géoprobe Continuous Sampling

Drill Rig: Geoprobe Total Depth: 28 feet

**MW Installation Date:** 8/1/2013

Northing: NA

						1		1	1	
Depth (ft)	Elev. (ft.)	Well Diagram  Casing Type: 1" PVC	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks
		Concrete Pad			Asphalt  Dark Brown Clay	1	DT	0.0	16	
-					Gray Clay with Orange Mottling, Black Mottling at 8 feet	2	DT	0.0	16	Submitted to Lab
5_		PVC Riser				3	DT	0.0	19	
		Bentonite				4	DT	0.0	19	
10_		Chips				5	DT	0.0	24	
-					Brown Clay with Shale Fragments	6	DT	0.0	24	
					Brown Clay with Orange, Gray Mottling	7	DT	0.0	24	
15_						8	DT	0.0	24	
					Gray Clay, Soft	9	DT	0.0	18	
20_		Sand			Gray Clay, Moist	10	DT	0.0	18	
-					Gray Sand, Wet	11	DT	0.0	20	
		Slotted Pre- Packed Screen				12	DT	0.0	20	
25_						13	DT	0.0	20	
					Gray/ Brown Clay, Gravelly, Moist	14	DT	0.0	20	
30		·			End of Soil Boring = 28 feet					



# **Soil Boring / Monitoring** Well Number: MW-03

Project Number: C3210006 Project Name: Phase II ESA

Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

**Contractor:** Envirocore **Driller:** Jake Bradley

Drilling Method: Géoprobe Continuous Sampling

Drill Rig: Geoprobe Total Depth: 28 feet **MW Installation Date:** 8/1/2013

Northing: NA

						ı					
Depth (ft)	Elev. (ft.)	Well Diagram  Casing Type: 1" PVC	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks	
		Concrete			Concrete, Fill, Subbase Material, Sand & Gravel	1	DT	0.0	17		
-					Fill: Gray Clay	2	DT		0	No Recovery	
5		PVC Riser			Brown Clay with Gray Mottling, Dry	3	DT	0.0	15		
-		Bentonite				4	DT	0.0	15	Submitted to Lab	
10_		Chips				5	DT	0.0	24		
-					Gray Brown Clay with Orange Mottling, Shale Fragments	6	DT	0.0	24		
					Gray Clay with Shale Fragments, Moist at 18 feet	7	DT	0.0	24		
15						8	DT	0.0	24		
-		Sand	-Sand Slotted			9	DT	0.0	20		
_ 20						Gray Clay with Shale Fragments, Moist, Soft	10	DT	0.0	20	
-								11	DT	0.0	20
-		Slotted Pre-Packed Screen			Gray Brown Clay with Sand, Some Gravel	12	DT	0.0	12		
25 <u> </u>					Gray Sand with Gravel, Wet	13	DT	0.0	16		
					Gray Sand with Gravel, some Gray Clay, Wet	14	DT	0.0	16		
30					End of Soil Boring = 28 feet						



# **Soil Boring / Monitoring** Well Number: MW-04

Project Number: C3210006 Project Name: Phase II ESA

Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

**Contractor:** Envirocore **Driller:** Jake Bradley

Drilling Method: Géoprobe Continuous Sampling

Drill Rig: Geoprobe Total Depth: 28 feet **MW Installation Date:** 8/1/2013

Northing: NA

ø
Remarks
No Recovery
Submitted to Lab
No Recovery
\$



# **Soil Boring / Monitoring** Well Number: MW-05

Project Number: C3210006 Project Name: Phase II ESA

Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

**Contractor:** Envirocore **Driller:** Jake Bradley

Drilling Method: Géoprobe Continuous Sampling

Drill Rig: Geoprobe Total Depth: 27.3 feet MW Installation Date: 7/31/2013

Northing: NA

Depth (ft)	Elev. (ft.)	Well Diagram	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks
		Casing Type: 1" PVC								
-		Concrete Pad			Asphalt Fill, Brown Clay with Roots	1	DT	0.0	13	
-					Brown Clay with Orange Mottling, Soft	2	DT	0.0	13	
5_		PVC Riser			Brown Clay with Orange Mottling, Hard	3	DT	0.0	20	
-		Bentonite			Brown Clay, Hard	4	DT	0.0	20	
10_		Chips			Brown Clay with Gray Mottling	5	DT	0.0	24	
-						6	DT	0.0	24	
						7	DT	0.0	24	
15_					Gray Clay with trace of Shale	8	DT	0.0	24	
-		Sand			Brown Clay	9	DT	0.0	24	
20_		Sallu			Gray Clay, Wet	10	DT	0.0	24	
-						11	DT	0.0	22	
-		Slotted Pre- Packed Screen			Brown, Gray Sand with trace small gravel, Wet	12	DT	0.5	22	Submitted to Lab
25					End of Soil Boring = 27.3 feet					



# **Soil Boring / Monitoring** Well Number: MW-06

Project Number: C3210006 Project Name: Phase II ESA

Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

**Contractor:** Envirocore **Driller:** Jake Bradley

Drilling Method: Géoprobe Continuous Sampling

Drill Rig: Geoprobe Total Depth: 32 feet **MW Installation Date:** 8/1/2013

Northing: NA

						Ι				
Depth (ft)	Elev. (ft.)	Well Diagram  Casing Type: 1" PVC	Elev. (ft.)	Graphic Log	Description of Cuttings	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks
		a Concrete			Concrete					
		Pad			Fill, Brown Clay	1	DT	0.0	16	
					Brown Clay with Gray Mottling	2	DT		0	No Recovery
5		PVC Riser				3	DT	0.0	12	
					Brown Clay with Gray, Orange Mottling, trace of Sand	4	DT	0.0	12	
10_		Bentonite			Brown Clay with some Gray Clay	5	DT	0.1	24	Submitted to Lab
		Chips				6	DT	0.0	24	
					Gray Clay with trace of Shale Fragments	7	DT	0.0	24	
15						8	DT	0.0	24	
						9	DT	0.0	20	
20_						10	DT	0.0	20	
-						11	DT	0.0	22	
-						12	DT	0.0	22	
25		Slotted Pre-				13	DT	0.0	9	
		Packed Screen			Gray, Brown Sandy Clay, Wet	14	DT		0	No Recovery
30_						15	DT	0.0	15	
					Gray Clay with Gravel, Wet	16	DT	0.0	15	
- - 35					End of Soil Boring = 32 feet					
J		l .				-				



# **Soil Boring Number: B-07**

Project Number: C3210006

Project Name: Phase II ESA Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

Approved By:JAZ Contractor: Envirocore **Driller:** Jake Bradley

**Drilling Method:** Geoprobe Continuous Sampling

Drill Rig: Geoprobe

**Start/End Date:** 7/31/2013 Boring Depth: 16 feet

Northing: NA

Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks
_			Asphalt Gray Clay with Black Mottling, Gravel	1	DT	5.0	10	
-			Gray Clay with Orange Mottling	2	DT	1.8	10	
5			Brown Clay with Gray Mottling	3	DT	355	15	Submitted to Lab
_			Brown Clay with Gray, Orange Mottling, trace of Gravel	4	DT	6.0	15	
10			Brown Clay with Gray Mottling, trace of Shale Fragments	5	DT	0.4	24	
_				6	DT	0.0	24	
-			Brown Clay	7	DT	0.0	24	
15			Dark Brown Clay, trace of Shale Fragments, Soft	8	DT	0.0	24	
_		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	End of Soil Boring = 16 feet					
20								



# **Soil Boring Number: B-08**

Project Number: C3210006 Project Name: Phase II ESA

Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

Approved By:JAZ Contractor: Envirocore **Driller:** Jake Bradley

**Drilling Method:** Geoprobe Continuous Sampling

Drill Rig: Geoprobe

**Start/End Date:** 7/31/2013 Boring Depth: 12 feet Northing: NA

				1				
Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks
		:X:	Gravel					
_			Brown Sand, Odor	1	DT	0.0	10	
1 1			Black Clay, Brown Mottling, Odor					
_				2	DT	0.0	10	
1 1			Brown Clay with Gray Mottling, Soft, Odor					
5				3	DT	411	12	Submitted to Lab
1 1			Brown Clay with Gray Mottling, Hard, Odor					
_				4	DT	3.4	12	
10			Brown Clay with Gray, Orange Mottling, trace of Shale Fragments, Odor	5	DT	0.8	24	
-				6	DT	0.3	24	
			End of Soil Boring = 12 feet					
15 —								
-								
-								
20								



# **Soil Boring Number: B-09**

Project Number: C3210006

Project Name: Phase II ESA Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

Approved By:JAZ Contractor: Envirocore **Driller:** Jake Bradley

**Drilling Method:** Geoprobe Continuous Sampling

Drill Rig: Geoprobe

**Start/End Date:** 7/31/2013 Boring Depth: 10 feet

Northing: NA

Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks
_			Concrete Fill: Brown Clay with Gray Mottling, trace of Sand	1	DT	1.5	12	
_				2	DT		0	No Recovery
5			Fill: Orange, Red Sand with some Gravel	3	DT	13.4	8	
_			Fill: Black, Brown Sandy Clay with trace of small and large Gravel, Odor	4	DT	187.6	8	Submitted to Lab
10			Fill: Black, Brown Sandy Clay with trace of small and large Gravel, trace of large wood chips, Odor	5	DT	7.0	6	
-			End of Soil Boring = 10 feet					
_								
15								
-								
_								
20								



# **Soil Boring Number: B-10**

Project Number: C3210006

Project Name: Phase II ESA Site Location: 14030 State Road, North Royalton Client: Cuyahoga County Land Reutilization Corp

MSG Personnel: JNB

Approved By:JAZ Contractor: Envirocore **Driller:** Jake Bradley

**Drilling Method:** Geoprobe Continuous Sampling

Drill Rig: Geoprobe

**Start/End Date:** 7/31/2013 Boring Depth: 12 feet

Northing: NA

Depth (ft)	Elev. (ft.)	Graphic Log	Description	Number	Туре	FID/PID (ppm)	Recovery (in.)	Remarks
_			Asphalt Brown, Black, Clay with Gray, Black, Orange Mottling	1	DT	0.1	14	
_				2	DT		0	No Recovery
5				3	DT	0.1	16	
_				4	DT	0.0	16	
10			Gray Clay with Orange Mottling	5	DT	0.5	24	Submitted to Lab
-			End of Soil Boring = 12 feet	6	DT	0.0	24	
-								
15 								
-								
20								

# APPENDIX C LABORATORY ANALYTICAL REPORTS AND CHAIN OF CUSTODIES





### YOUR LAB OF CHOICE

12065 Lebanon Rd. Mt. Juliet, TN 37122 (615) 758-5858 1-800-767-5859 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

# Report Summary

Wednesday August 14, 2013

Report Number: L650036 Samples Received: 08/03/13 Client Project: C3210006

Description: North Royalton Phase II ESA

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Leslie Newton , ESC Representative

# Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

This report may not be reproduced, except in full, without written approval from ESC Lab Sciences. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS Mr. Matt Danus

The Mannik and Smith Group, Inc. 23225 Mercantile Rd.

Beachwood, OH 44122

ESC Sample # : L650036-01

August 14, 2013

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Sample ID : DUP 073113 Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	86.4	0.100	%	2540 G-2011	08/08/13	1
Benzene Toluene Ethylbenzene Total Xylene Methyl tert-butyl ether	BDL BDL BDL BDL BDL	0.0029 0.029 0.0029 0.0087 0.0058	mg/kg mg/kg mg/kg mg/kg mg/kg	8021 8021 8021 8021 8021	08/08/13 08/08/13 08/08/13 08/08/13 08/08/13	5 5 5 5
<pre>Surrogate Recovery(%)   a,a,a-Trifluorotoluene(PID)</pre>	101.		% Rec.	8021	08/08/13	5

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-02

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : Sample ID : EB 073113

Collected By : Jamie B

Collection Date: 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons						_
Anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/1	8270 C-SIM 8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
, ,	BDL	0.000050		8270 C-SIM 8270 C-SIM	08/08/13	1
Chrysene Dibenz(a,h)anthracene		0.000050	mg/l	8270 C-SIM 8270 C-SIM		1
` ', '	BDL		mg/l		08/08/13	1
Fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Pyrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
2-Methylnaphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Surrogate Recovery			3.			
Nitrobenzene-d5	72.3		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	76.9		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	74.7		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted. This report shall not be reproduced, except in full, without the written approval from ESC.



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Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

Collected By

August 14, 2013

ESC Sample # : L650036-03

Project # : C3210006

Date Received : August 03, 2013

Description : North Royalton Phase II ESA

Jamie B

Site ID :

Sample ID : FB 073113

Collection Date : 08/02/13 17:00

Result Det. Limit Units Method Date Dil. Parameter Polynuclear Aromatic Hydrocarbons BDL 0.000050 mg/18270 C-SIM 08/08/13 Anthracene 1 Acenaphthene BDL 0.000050 08/08/13 mg/18270 C-SIM 1 mg/18270 C-SIM BDL 0.000050 08/08/13 1 Acenaphthylene BDT. 0.000050 8270 C-STM 08/08/13 Benzo(a)anthracene 1 mg/l0.000050 8270 C-SIM BDL 08/08/13 Benzo(a)pyrene mg/11 0.000050 8270 C-SIM 8270 C-SIM Benzo(b)fluoranthene 08/08/13 RDT. mg/11 1 Benzo(g,h,i)perylene BDL 0.000050 mg/108/08/13 Benzo(k)fluoranthene BDT. 0.000050 mg/18270 C-SIM 08/08/13 1 Chrysene BDL 0.000050 mg/18270 C-SIM 08/08/13 1 Dibenz(a,h)anthracene BDT. 0.000050 mg/18270 C-SIM 08/08/13 1 Fluoranthene BDL 0.000050 mg/18270 C-SIM 08/08/13 1 Fluorene BDL 0.000050 mg/18270 C-SIM 08/08/13 1 Indeno(1,2,3-cd)pyrene BDL 0.000050 mg/18270 C-SIM 08/08/13 Naphthalene BDL 0.00025 mg/18270 C-SIM 08/08/13 1 Phenanthrene BDL 0.000050 mg/18270 C-SIM 08/08/13 1 Pyrene BDL 0.000050 mg/18270 C-SIM 08/08/13 1-Methylnaphthalene BDL 0.00025 mg/18270 C-SIM 08/08/13 1 2-Methylnaphthalene 0.00025 mg/18270 C-SIM 08/08/13 BDL 2-Chloronaphthalene BDL 0.00025 mg/18270 C-SIM 08/08/13 1 Surrogate Recovery Nitrobenzene-d5 8270 C-SIM 08/08/13 82.3 % Rec. 1 8270 C-SIM 2-Fluorobiphenyl 83.0 08/08/13 % Rec. 1 p-Terphenyl-d14 78.0 % Rec. 8270 C-SIM 08/08/13 1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Sample ID

12065 Lebanon Rd. Mt. Juliet, TN 37122 (615) 758-5858 1-800-767-5859 Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-04

: MW-01

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.21	0.00050	mq/l	8021	08/06/13	1
Toluene	0.088	0.0050	mg/l	8021	08/06/13	ī
Ethylbenzene	0.10	0.00050	mq/l	8021	08/06/13	1
Total Xylene	0.38	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	0.025	0.0010	mg/l	8021	08/06/13	1
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-05

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : MW-02 Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	ma/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/1	8021	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/1	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	96.3		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-06

Project # : C3210006

Date Received : August 03, 2013

Description : North Royalton Phase II ESA

Site ID : Sample ID : MW-03

Collected By : Jamie B

Collection Date : 08/02/13 17:00

Result Det. Limit Units Method Date Dil. Parameter Volatile Organics BDL 0.050 mq/18260B 08/06/13 Acetone 1 BDL Acrylonitrile 0.010 8260B 08/06/13 mg/11 0.0010 mg/1BDL 8260B 08/06/13 1 Benzene BDT. 0.0010 8260B 08/06/13 Bromobenzene mg/11 mg/1Bromodichloromethane 8260B 08/06/13 BDL 0.0010 1 08/06/13 Bromoform BDL 0.0010 mg/18260B 1 0.0050 1 Bromomethane BDL mg/18260B 08/06/13 n-Butylbenzene BDT. 0.0010 mg/18260B 08/06/13 1 sec-Butylbenzene BDL 0.0010 mg/18260B 08/06/13 1 tert-Butylbenzene BDT. 0.0010 mg/18260B 08/06/13 1 Carbon tetrachloride BDL 0.0010 mg/18260B 08/06/13 1 Chlorobenzene BDL 0.0010 mg/18260B 08/06/13 1 Chlorodibromomethane BDL 0.0010 8260B 08/06/13 mg/1mg/1Chloroethane BDL 0.0050 8260B 08/06/13 1 2-Chloroethyl vinyl ether BDL 0.050 8260B 08/06/13 1 mg/1Chloroform BDL 0.0050 mg/18260B 08/06/13 Chloromethane BDL 0.0025 mg/18260B 08/06/13 0.0010 8260B 08/06/13 2-Chlorotoluene BDL mg/14-Chlorotoluene BDL 0.0010 mg/18260B 08/06/13 1 1,2-Dibromo-3-Chloropropane 08/06/13 BDL 0.0050 mg/18260B 1 1,2-Dibromoethane BDL 0.0010 08/06/13 8260B mq/11 0.0010 mg/18260B 08/06/13 Dibromomethane BDL 1,2-Dichlorobenzene BDT. 0.0010 mg/18260B 08/06/13 1 mg/108/06/13 1,3-Dichlorobenzene BDL 0.0010 8260B 1 0.0010 1.4-Dichlorobenzene BDL 08/06/13 mg/18260B 1 Dichlorodifluoromethane 0.0050 8260B 08/06/13 1 BDT. mg/l0.0010 1,1-Dichloroethane BDL mg/18260B 08/06/13 1 1,2-Dichloroethane BDL 0.0010 mg/18260B 08/06/13 1 1,1-Dichloroethene BDL 0.0010 mg/18260B 08/06/13 1 cis-1,2-Dichloroethene BDL 0.0010 mg/18260B 08/06/13 1 trans-1,2-Dichloroethene BDL 0.0010 mg/18260B 08/06/13 1 1,2-Dichloropropane BDL 0.0010 mg/l8260B 08/06/13 1 mg/11,1-Dichloropropene  $\mathtt{BDL}$ 0.0010 8260B 08/06/13 1 1,3-Dichloropropane BDL 0.0010 mg/18260B 08/06/13 1 cis-1,3-Dichloropropene BDL 0.0010 mg/18260B 08/06/13 trans-1,3-Dichloropropene BDL 0.0010 mg/18260B 08/06/13 0.0010 2,2-Dichloropropane BDL mg/18260B 08/06/13 Di-isopropyl ether BDL 0.0010 mg/18260B 08/06/13 Ethylbenzene BDL 0.0010 mg/18260B 08/06/13 1 Hexachloro-1,3-butadiene BDL 0.0010 mq/18260B 08/06/13 1 mg/108/06/13 0.010 8260B 1 n-Hexane BDL Isopropylbenzene 0.0010 08/06/13 BDL mg/18260B 1 p-Isopropyltoluene BDL 0.0010 mq/18260B 08/06/13 1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)



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C3210006

REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

Site ID :

Project # :

ESC Sample # : L650036-06

Date Received : August 03, 2013

Description : North Royalton Phase II ESA

Sample ID : MW-03

Collected By : Jamie B

Collection Date : 08/02/13 17:00

Parameter Result Det. Limit Units Method Date Dil. 2-Butanone (MEK) BDL 0.010 8260B 08/06/13 1 mq/1Methylene Chloride mg/1BDL 0.0050 8260B 08/06/13 1 4-Methyl-2-pentanone (MIBK) Methyl tert-butyl ether BDL mg/108/06/13 0.010 8260B 1 BDL 0.0010 mg/l8260B 08/06/13 1 Naphthalene BDT. 0.0050 8260B 08/06/13 mg/11 08/06/13 8260B n-Propylbenzene BDL 0.0010 mg/11 08/06/13 Styrene RDT. 0.0010 mg/18260B 1  $1,\bar{1},1,2$ -Tetrachloroethane 1 BDL 0.0010 mg/18260B 08/06/13 1,1,2,2-Tetrachloroethane BDT. 0.0010 mg/18260B 08/06/13 1 Tetrachloroethene BDL 0.0010 mg/18260B 08/06/13 1 Toluene BDT. 0.0050 mg/18260B 08/06/13 1 1,2,3-Trichlorobenzene BDL 0.0010 mg/18260B 08/06/13 1 1,2,4-Trichlorobenzene BDL 0.0010 mg/18260B 08/06/13 1 1,1,1-Trichloroethane BDL 0.0010 8260B 08/06/13 mg/1mg/11,1,2-Trichloroethane BDL 0.0010 8260B 08/06/13 1 Trichloroethene BDL 0.0010 8260B 08/06/13 1 mg/1Trichlorofluoromethane BDL 0.0050 mg/18260B 08/06/13 1,2,3-Trichloropropane BDL 0.0025 mg/18260B 08/06/13 1 1,2,4-Trimethylbenzene 0.0010 08/06/13 BDL mg/18260B 1,3,5-Trimethylbenzene BDL 0.0010 mg/18260B 08/06/13 1 Vinyl chloride BDL 0.0010 mg/18260B 08/06/13 1 Xylenes, Total Surrogate Recovery  ${\it mg/l}$ BDL 0.0030 8260B 08/06/13 1 Toluene-d8 105. % Rec. 8260B 08/06/13 1 Dibromofluoromethane % Rec. 08/06/13 105. 8260B 1 a,a,a-Trifluorotoluene 08/06/13 106. % Rec. 8260B 1 4-Bromofluorobenzene 08/06/13 105. % Rec. 8260B 1 Polynuclear Aromatic Hydrocarbons Anthracene BDT. 0.000050 mg/18270 C-SIM 08/08/13 1 Acenaphthene BDL 0.000050 mg/18270 C-SIM 08/08/13 1 Acenaphthylene BDL 0.000050 mg/18270 C-SIM 08/08/13 1 Benzo(a)anthracene BDL 0.000050 mg/18270 C-SIM 08/08/13 1 Benzo(a)pyrene mg/1BDL 0.000050 8270 C-SIM 08/08/13 1 Benzo(b) fluoranthene BDL 0.000050 8270 C-SIM 08/08/13 1 mg/1mg/1Benzo(g,h,i)perylene BDL 0.000050 8270 C-SIM 08/08/13 0.000050 Benzo(k)fluoranthene BDL mg/18270 C-SIM 08/08/13 Chrysene BDL 0.000050 mg/18270 C-SIM 08/08/13 Dibenz(a,h)anthracene BDL 0.000050 mg/18270 C-SIM 08/08/13 8270 C-SIM Fluoranthene BDL 0.000050 mg/108/08/13 1 BDL 0.000050 8270 C-SIM 08/08/13 Fluorene ma/11 mg/1Indeno(1,2,3-cd)pyrene 0.000050 8270 C-SIM 08/08/13 1 BDL Naphthalene 0.00025 8270 C-SIM 08/08/13 BDL mg/11 8270 C-SIM 08/08/13 BDL 0.000050 mq/11 Phenant.hrene

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)



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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-06

Date Received August 03, 2013

Description North Royalton Phase II ESA

Site ID : MW - 03

Sample ID Project # : C3210006

Collected By Jamie B Collection Date : 08/02/13 17:00

Det. Limit Units Method Dil. Parameter Result Date 0.000050 BDL mg/l8270 C-SIM 08/08/13 Pyrene mg/18270 C-SIM 08/08/13 1-Methylnaphthalene BDL 0.00025 1 0.00025 mg/18270 C-SIM 2-Methylnaphthalene BDL 08/08/13 1 2-Chloronaphthalene 8270 C-SIM BDL 0.00025 mg/l08/08/13 1 Surrogate Recovery 84.6 % Rec. 8270 C-SIM 08/08/13 Nitrobenzene-d5 1 8270 C-SIM 8270 C-SIM 8270 C-SIM 2-Fluorobiphenyl 82.4 79.0 08/08/13 % Rec. 1 08/08/13 1 p-Terphenyl-d14 % Rec.

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-07

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : Sample ID : MW-04

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mq/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mq/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	0.0049	0.0010	mg/1	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	96.2		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd.

Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-08

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : : MW-05 Sample ID

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date Dil.
Volatile Organics					
Acetone	BDL	0.050	mq/l	8260B	08/06/13 1
Acrylonitrile	BDL	0.010	mg/l	8260B	08/06/13 1
Benzene	BDL	0.0010	mg/1	8260B	08/06/13 1
Bromobenzene	BDL	0.0010	mg/l	8260B	08/06/13 1
Bromodichloromethane	BDL	0.0010	mg/1	8260B	08/06/13 1
Bromoform	BDL	0.0010	mg/l	8260B	08/06/13 1
Bromomethane	BDL	0.0010	mg/1	8260B	08/06/13 1
n-Butvlbenzene	BDL	0.0030	mq/1	8260B	08/06/13 1
sec-Butylbenzene	BDL	0.0010	mq/1	8260B	08/06/13 1
tert-Butylbenzene	BDL	0.0010	mg/1	8260B	08/06/13 1
Carbon tetrachloride	BDL	0.0010	mq/1	8260B	08/06/13 1
Chlorobenzene	BDL	0.0010	mg/1	8260B	08/06/13 1
Chlorodibromomethane		0.0010		8260B	
Chloroethane	BDL		mg/l	8260B 8260B	
	BDL	0.0050	mg/l		08/06/13 1
2-Chloroethyl vinyl ether	BDL	0.050	mg/l	8260B	08/06/13 1
Chloroform	BDL	0.0050	mg/l	8260B	08/06/13 1
Chloromethane	BDL	0.0025	mg/l	8260B	08/06/13 1
2-Chlorotoluene	BDL	0.0010	mg/l	8260B	08/06/13 1
4-Chlorotoluene	BDL	0.0010	mg/l	8260B	08/06/13 1
1,2-Dibromo-3-Chloropropane	BDL	0.0050	mg/l	8260B	08/06/13 1
1,2-Dibromoethane	BDL	0.0010	mg/1	8260B	08/06/13 1
Dibromomethane	BDL	0.0010	mg/l	8260B	08/06/13 1
1,2-Dichlorobenzene	BDL	0.0010	mg/1	8260B	08/06/13 1
1,3-Dichlorobenzene	BDL	0.0010	mg/1	8260B	08/06/13 1
1,4-Dichlorobenzene	BDL	0.0010	mg/1	8260B	08/06/13 1
Dichlorodifluoromethane	BDL	0.0050	mg/1	8260B	08/06/13 1
1,1-Dichloroethane	BDL	0.0010	mg/1	8260B	08/06/13 1
1,2-Dichloroethane	BDL	0.0010	mg/1	8260B	08/06/13 1
1,1-Dichloroethene	BDL	0.0010	mg/1	8260B	08/06/13 1
cis-1,2-Dichloroethene	BDL	0.0010	mg/1	8260B	08/06/13 1
trans-1,2-Dichloroethene	BDL	0.0010	mg/1	8260B	08/06/13 1
1,2-Dichloropropane	BDL	0.0010	mg/1	8260B	08/06/13 1
1,1-Dichloropropene	BDL	0.0010	mg/1	8260B	08/06/13 1
1,3-Dichloropropane	BDL	0.0010	mg/1	8260B	08/06/13 1
cis-1,3-Dichloropropene	BDL	0.0010	mg/1	8260B	08/06/13 1
trans-1,3-Dichloropropene	BDL	0.0010	mg/1	8260B	08/06/13 1
2,2-Dichloropropane	BDL	0.0010	mg/1	8260B	08/06/13 1
Di-isopropyl ether	BDL	0.0010	mg/l	8260B	08/06/13 1
Ethylbenzene	BDL	0.0010	mg/1	8260B	08/06/13 1
Hexachloro-1,3-butadiene	BDL	0.0010	mg/l	8260B	08/06/13 1
n-Hexane	BDL	0.010	mg/1	8260B	08/06/13 1
Isopropylbenzene	BDL	0.0010	mg/1	8260B	08/06/13 1
p-Isopropyltoluene	BDL	0.0010	mg/1	8260B	08/06/13 1

BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd.

Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-08

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : : MW-05 Sample ID

Project # : C3210006

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
2-Butanone (MEK)	BDL	0.010	mq/l	8260B	08/06/13	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	08/06/13	ī
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8260B	08/06/13	ī
Naphthalene	BDL	0.0050	mg/l	8260B	08/06/13	1
n-Propylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Styrene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	08/06/13	ī
Toluene	BDL	0.0050	mg/l	8260B	08/06/13	ī
1,2,3-Trichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
1,2,4-Trichlorobenzene	BDL	0.0010	mg/l	8260B	08/06/13	ī
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	08/06/13	ī
Trichloroethene	BDL	0.0010	mg/l	8260B	08/06/13	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	08/06/13	i
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	08/06/13	1
1,2,4-Trimethylbenzene	BDL	0.0010	mg/1	8260B	08/06/13	i
1,3,5-Trimethylbenzene	BDL	0.0010	mg/l	8260B	08/06/13	1
Vinyl chloride	BDL	0.0010	mg/1	8260B	08/06/13	1
Xylenes, Total	BDL	0.0010	mg/1	8260B	08/06/13	1
Surrogate Recovery	БИЦ	0.0030	ilig/ I	02000	00/00/13	1
Toluene-d8	105.		% Rec.	8260B	08/06/13	1
Dibromofluoromethane	106.		% Rec.	8260B	08/06/13	1
a,a,a-Trifluorotoluene	105.		% Rec.	8260B	08/06/13	1
4-Bromofluorobenzene	106.		% Rec.	8260B	08/06/13	1
4-Bromorradenzene	100.		* Rec.	02006	00/00/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Chrysene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Dibenz(a,h)anthracene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Fluoranthene	0.000069	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)



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Tax I.D. 62-0814289

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-08

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : Sample ID : MW-05

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Pyrene	0.000050	0.000050	mq/l	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	ī
2-Methylnaphthalene	BDL	0.00025	mg/l	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
Surrogate Recovery						
Nitrobenzene-d5	61.1		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	64.0		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	62.4		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd.

Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-09

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : Sample ID : MW-06

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/1	8021	08/06/13	1
Surrogate Recovery(%)			_			
a,a,a-Trifluorotoluene(PID)	95.9		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-10

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : : FB080213 Sample ID

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Acenaphthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	ī
Acenaphthylene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Benzo(a)pyrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Benzo(b)fluoranthene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Benzo(g,h,i)perylene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Benzo(k)fluoranthene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Chrysene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Dibenz(a,h)anthracene	BDL	0.000050	mg/l	8270 C-SIM	08/08/13	1
Fluoranthene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Fluorene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Naphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
Phenanthrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
Pyrene	BDL	0.000050	mg/1	8270 C-SIM	08/08/13	1
1-Methylnaphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
2-Methylnaphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
2-Chloronaphthalene	BDL	0.00025	mg/1	8270 C-SIM	08/08/13	1
Surrogate Recovery						
Nitrobenzene-d5	73.2		% Rec.	8270 C-SIM	08/08/13	1
2-Fluorobiphenyl	81.5		% Rec.	8270 C-SIM	08/08/13	1
p-Terphenyl-d14	82.0		% Rec.	8270 C-SIM	08/08/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-11

Project # : C3210006

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID : Sample ID : EB080213

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	ma/l	8021	08/06/13	1
Toluene	BDL	0.0050	mg/l	8021	08/06/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/06/13	1
Total Xylene	BDL	0.0015	mg/1	8021	08/06/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/1	8021	08/06/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	96.2		% Rec.	8021	08/06/13	1

BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14, 2013

ESC Sample # : L650036-12

Project # : C3210006

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID : Sample ID : DUP080213

Collected By : Jamie B
Collection Date : 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	08/08/13	1
Toluene	BDL	0.0050	mg/l	8021	08/08/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/08/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/08/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/1	8021	08/08/13	1
Surrogate Recovery(%)			_			
a,a,a-Trifluorotoluene(PID)	99.6		% Rec.	8021	08/08/13	1

BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-13

Date Received : August 03, 2013
Description : North Royalton Phase II ESA

Site ID :

Sample ID : TB80213 Project # : C3210006

Collected By : Jamie B Collection Date : 08/02/13 08/02/13 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mq/l	8021	08/08/13	1
Toluene	BDL	0.0050	mg/l	8021	08/08/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021	08/08/13	1
Total Xylene	BDL	0.0015	mg/l	8021	08/08/13	1
Methyl tert-butyl ether	BDL	0.0010	mg/l	8021	08/08/13	1
Surrogate Recovery(%)			_			
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	08/08/13	1

BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:

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REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-15

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

: MW-01 4-6FT Sample ID Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	84.5	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	24.	5.9	mg/kg	8015	08/08/13	50
Surrogate Recovery-% a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015	08/08/13	50
Benzene	0.41	0.24	mg/kg	8260B	08/07/13	200
Toluene	2.4	1.2	mg/kg	8260B	08/07/13	200
Ethylbenzene	11.	0.24	mg/kg	8260B	08/07/13	200
Total Xylenes	54.	0.71	mg/kg	8260B	08/07/13	200
Methyl tert-butyl ether	BDL	0.24	mg/kg	8260B	08/07/13	200
Surrogate Recovery						
Toluene-d8	99.8		% Rec.	8260B	08/07/13	200
Dibromofluoromethane	100.		% Rec.	8260B	08/07/13	200
4-Bromofluorobenzene	101.		% Rec.	8260B	08/07/13	200
Ohio DRO						
C10-C20 Hydrocarbons	45.	4.7	mq/kq	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.7	mg/kg	8015M	08/09/13	1
Surrogate Recovery o-Terphenyl	81.5		% Rec.	8015M	08/09/13	1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

Sample ID

August 14,2013

ESC Sample # : L650036-16

Date Received : August 03, 2013

: North Royalton Phase II ESA Description : MW-02 2-4FT

Site ID :

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	79.5	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12 Surrogate Recovery-%	BDL	0.63	mg/kg	8015	08/07/13	5
a,a,a-Trifluorotoluene(FID)	95.6		% Rec.	8015	08/07/13	5
Benzene Toluene Ethylbenzene Total Xylenes Methyl tert-butyl ether Surrogate Recovery Toluene-d8 Dibromofluoromethane 4-Bromofluorobenzene	BDL BDL BDL BDL BDL 96.4 92.9 98.2	0.0063 0.031 0.0063 0.019 0.0063	mg/kg mg/kg mg/kg mg/kg mg/kg % Rec. % Rec.	8260B 8260B 8260B 8260B 8260B 8260B 8260B 8260B	08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13	5 5 5 5 5 5
Ohio DRO C10-C20 Hydrocarbons C20-C34 Hydrocarbons Surrogate Recovery o-Terphenyl	BDL BDL 80.2	5.0 5.0	mg/kg mg/kg % Rec.	8015M 8015M 8015M	08/09/13 08/09/13 08/09/13	1 1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-17

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Project # : C3210006

Sample ID : MW-03 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	76.4	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.65	mg/kg	8015	08/07/13	5
Surrogate Recovery-%	222	0.05	7 12 3	0010	00,0,,15	J
a,a,a-Trifluorotoluene(FID)	95.7		% Rec.	8015	08/07/13	5
Volatile Organics						
Acetone	BDL	0.33	mq/kq	8260B	08/06/13	5
Acrylonitrile	BDL	0.065	mg/kg	8260B	08/06/13	5
Benzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromodichloromethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromoform	BDL	0.0065	mg/kg	8260B	08/06/13	5
Bromomethane	BDL	0.033	mg/kg	8260B	08/06/13	5
n-Butylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
sec-Butylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
tert-Butylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Carbon tetrachloride	BDL	0.0065	mg/kg	8260B	08/06/13	5
Chlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Chlorodibromomethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Chloroethane	BDL	0.033	mg/kg	8260B	08/06/13	5
2-Chloroethyl vinyl ether	BDL	0.33	mg/kg	8260B	08/06/13	5
Chloroform	BDL	0.033	mg/kg	8260B	08/06/13	5
Chloromethane	BDL	0.016	mg/kg	8260B	08/06/13	5
2-Chlorotoluene	BDL	0.0065	mg/kg	8260B	08/06/13	5
4-Chlorotoluene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dibromo-3-Chloropropane	BDL	0.033	mg/kg	8260B	08/06/13	5
1,2-Dibromoethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Dibromomethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,3-Dichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,4-Dichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Dichlorodifluoromethane	BDL	0.033	mg/kg	8260B	08/06/13	5
1,1-Dichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1-Dichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
cis-1,2-Dichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
trans-1,2-Dichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2-Dichloropropane	BDL	0.0065		8260B	08/06/13	5
			mg/kg	8260B		5 5
1,1-Dichloropropene	BDL	0.0065	mg/kg	8260B 8260B	08/06/13	
1,3-Dichloropropane	BDL	0.0065	mg/kg		08/06/13	5 5
cis-1,3-Dichloropropene	BDL	0.0065	mg/kg	8260B	08/06/13	
trans-1,3-Dichloropropene	BDL	0.0065	mg/kg	8260B	08/06/13	5
2,2-Dichloropropane	BDL	0.0065	mg/kg	8260B	08/06/13	5

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

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Mr. Matt Danus

Sample ID

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

August 14,2013

The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-17

Date Received : August 03, 2013

: North Royalton Phase II ESA Description : MW-03 6-8FT

Site ID :

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Di-isopropyl ether	BDL	0.0065	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Hexachloro-1,3-butadiene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Isopropylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
p-Isopropyltoluene	BDL	0.0065	mg/kg	8260B	08/06/13	5
2-Butanone (MEK)	BDL	0.065	mg/kg	8260B	08/06/13	5
Methylene Chloride	BDL	0.033	mg/kg	8260B	08/06/13	5
4-Methyl-2-pentanone (MIBK)	BDL	0.065	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0065	mg/kg	8260B	08/06/13	5
Naphthalene	BDL	0.033	mg/kg	8260B	08/06/13	5
n-Propylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Styrene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,1,2-Tetrachloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,2,2-Tetrachloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,2-Trichlorotrifluoroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Tetrachloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.033	mg/kg	8260B	08/06/13	5
1,2,3-Trichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2,4-Trichlorobenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,1-Trichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,1,2-Trichloroethane	BDL	0.0065	mg/kg	8260B	08/06/13	5
Trichloroethene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Trichlorofluoromethane	BDL	0.033	mg/kg	8260B	08/06/13	5
1,2,3-Trichloropropane	BDL	0.016	mg/kg	8260B	08/06/13	5
1,2,4-Trimethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,2,3-Trimethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Vinyl chloride	BDL	0.0065	mg/kg	8260B	08/06/13	5
1,3,5-Trimethylbenzene	BDL	0.0065	mg/kg	8260B	08/06/13	5
Xylenes, Total	BDL	0.020	mg/kg	8260B	08/06/13	5
Surrogate Recovery			3. 3			
Toluene-d8	96.4		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	92.0		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	99.9		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	5.2	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	5.2	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	73.3		% Rec.	8015M	08/09/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.043	mg/kg	8270C	08/07/13	1
Acenaphthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Acenaphthylene	BDL	0.043	mg/kg	8270C	08/07/13	1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-17

Date Received : August 03, 2013

: North Royalton Phase II ESA Description : MW-03 6-8FT

Site ID :

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)anthracene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(a)pyrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(b)fluoranthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(g,h,i)perylene	BDL	0.043	mg/kg	8270C	08/07/13	1
Benzo(k)fluoranthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Chrysene	BDL	0.043	mg/kg	8270C	08/07/13	1
Dibenz(a,h)anthracene	BDL	0.043	mg/kg	8270C	08/07/13	1
Fluoranthene	BDL	0.043	mg/kg	8270C	08/07/13	1
Fluorene	BDL	0.043	mg/kg	8270C	08/07/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Naphthalene	BDL	0.043	mg/kg	8270C	08/07/13	1
Phenanthrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Pyrene	BDL	0.043	mg/kg	8270C	08/07/13	1
Surrogate Recovery						
Nitrobenzene-d5	115.		% Rec.	8270C	08/07/13	1
2-Fluorobiphenyl	111.		% Rec.	8270C	08/07/13	1
p-Terphenyl-d14	82.4		% Rec.	8270C	08/07/13	1
Polychlorinated Biphenyls						
PCB 1016	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1221	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1232	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1242	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1248	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1254	BDL	0.022	mg/kg	8082	08/06/13	1
PCB 1260	BDL	0.022	mg/kg	8082	08/06/13	1
PCBs Surrogates						
Decachlorobiphenyl	71.8		% Rec.	8082	08/06/13	1
Tetrachloro-m-xylene	92.2		% Rec.	8082	08/06/13	1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-18

Project # : C3210006

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Sample ID : MW-04 10-12FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	87.0	0.100	90	2540 G-2011	08/08/13	1
TPHG C6 - C12 Surrogate Recovery-%	BDL	0.57	mg/kg	8015	08/07/13	5
a,a,a-Trifluorotoluene(FID)	96.0		% Rec.	8015	08/07/13	5
Benzene Toluene Ethylbenzene Total Xylenes Methyl tert-butyl ether Surrogate Recovery Toluene-d8 Dibromofluoromethane 4-Bromofluorobenzene	BDL BDL BDL BDL BDL 95.7 93.3 95.9	0.0057 0.029 0.0057 0.017 0.0057	mg/kg mg/kg mg/kg mg/kg mg/kg * Rec. * Rec.	8260B 8260B 8260B 8260B 8260B 8260B 8260B 8260B	08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13	5 5 5 5 5 5
Ohio DRO C10-C20 Hydrocarbons C20-C34 Hydrocarbons Surrogate Recovery o-Terphenyl	BDL BDL 82.4	4.6 4.6	mg/kg mg/kg % Rec.	8015M 8015M 8015M	08/09/13 08/09/13 08/09/13	1 1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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Est. 1970

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-19

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Sample ID : MW-05 22-24FT Project # : C3210006

Collected By : Jamie B Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	88.3	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	BDL	0.57	mg/kg	8015	08/07/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	94.5		% Rec.	8015	08/07/13	5
Volatile Organics						
Acetone	BDL	0.28	mg/kg	8260B	08/06/13	5
Acrylonitrile	BDL	0.057	mg/kg	8260B	08/06/13	5
Benzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromodichloromethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromoform	BDL	0.0057	mg/kg	8260B	08/06/13	5
Bromomethane	BDL	0.028	mg/kg	8260B	08/06/13	5
n-Butylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
sec-Butylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
tert-Butylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Carbon tetrachloride	BDL	0.0057	mg/kg	8260B	08/06/13	5
Chlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Chlorodibromomethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Chloroethane	BDL	0.028	mg/kg	8260B	08/06/13	5
2-Chloroethyl vinyl ether	BDL	0.28	mg/kg	8260B	08/06/13	5
Chloroform	BDL	0.028	mg/kg	8260B	08/06/13	5
Chloromethane	BDL	0.014	mg/kg	8260B	08/06/13	5
2-Chlorotoluene	BDL	0.0057	mg/kg	8260B	08/06/13	5
4-Chlorotoluene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dibromo-3-Chloropropane	BDL	0.028	mg/kg	8260B	08/06/13	5
1,2-Dibromoethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Dibromomethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,3-Dichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,4-Dichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Dichlorodifluoromethane	BDL	0.028	mg/kg	8260B	08/06/13	5
1,1-Dichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1-Dichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
cis-1,2-Dichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
trans-1,2-Dichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2-Dichloropropane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1-Dichloropropene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,3-Dichloropropane	BDL	0.0057	mg/kg	8260B	08/06/13	5
cis-1,3-Dichloropropene	BDL	0.0057	mg/kg	8260B	08/06/13	5
trans-1,3-Dichloropropene	BDL	0.0057	mg/kg	8260B	08/06/13	5
2,2-Dichloropropane	BDL	0.0057	mg/kg	8260B	08/06/13	5
2,2 DICHIOTOPTOPAHE	חתם	0.0057	ilig/ kg	02000	00/00/13	J

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-19

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Sample ID : MW-05 22-24FT

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Di-isopropyl ether	BDL	0.0057	mg/kg	8260B	08/06/13	5
Ethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Hexachloro-1,3-butadiene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Isopropylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
p-Isopropyltoluene	BDL	0.0057	mg/kg	8260B	08/06/13	5
2-Butanone (MEK)	BDL	0.057	mg/kg	8260B	08/06/13	5
Methylene Chloride	BDL	0.028	mg/kg	8260B	08/06/13	5
4-Methyl-2-pentanone (MIBK)	BDL	0.057	mg/kg	8260B	08/06/13	5
Methyl tert-butyl ether	BDL	0.0057	mg/kg	8260B	08/06/13	5
Naphthalene	BDL	0.028	mg/kg	8260B	08/06/13	5
n-Propylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Styrene	BDL	0.0057	mg/kg	8260B	08/06/13	5
$1, \hat{1}, 1, 2$ -Tetrachloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,2,2-Tetrachloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,2-Trichlorotrifluoroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Tetrachloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Toluene	BDL	0.028	mg/kg	8260B	08/06/13	5
1,2,3-Trichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2,4-Trichlorobenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,1-Trichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,1,2-Trichloroethane	BDL	0.0057	mg/kg	8260B	08/06/13	5
Trichloroethene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Trichlorofluoromethane	BDL	0.028	mg/kg	8260B	08/06/13	5
1,2,3-Trichloropropane	BDL	0.014	mg/kg	8260B	08/06/13	5
1,2,4-Trimethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,2,3-Trimethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Vinyl chloride	BDL	0.0057	mg/kg	8260B	08/06/13	5
1,3,5-Trimethylbenzene	BDL	0.0057	mg/kg	8260B	08/06/13	5
Xylenes, Total	BDL	0.017	mg/kg	8260B	08/06/13	5
Surrogate Recovery						
Toluene-d8	96.3		% Rec.	8260B	08/06/13	5
Dibromofluoromethane	93.8		% Rec.	8260B	08/06/13	5
4-Bromofluorobenzene	96.1		% Rec.	8260B	08/06/13	5
Ohio DRO						
C10-C20 Hydrocarbons	BDL	4.5	mg/kg	8015M	08/09/13	1
C20-C34 Hydrocarbons	BDL	4.5	mg/kg	8015M	08/09/13	1
Surrogate Recovery						
o-Terphenyl	84.6		% Rec.	8015M	08/09/13	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.037	mg/kg	8270C	08/07/13	1
Acenaphthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Acenaphthylene	BDL	0.037	mg/kg	8270C	08/07/13	1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Mr. Matt Danus August 14,2013

The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-19

Project # : C3210006

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID : Sample ID : MW-05 22-24FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)anthracene	BDL	0.037	mg/kg	8270C	08/07/13	1
Benzo(a) anchi acene Benzo(a) pyrene	BDL	0.037	mg/kg	8270C 8270C	08/07/13	1
Benzo(b)fluoranthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Benzo(g,h,i)perylene	BDL	0.037	mg/kg	8270C	08/07/13	1
Benzo(k)fluoranthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Chrysene	BDL	0.037	mg/kg	8270C	08/07/13	1
Dibenz(a,h)anthracene	BDL	0.037	mg/kg	8270C	08/07/13	1
Fluoranthene	BDL	0.037	mg/kg	8270C	08/07/13	1
Fluorene	BDL	0.037	mg/kg	8270C	08/07/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.037	mg/kg	8270C	08/07/13	1
Naphthalene	BDL	0.037	mg/kg	8270C	08/07/13	1
Phenanthrene	BDL	0.037	mg/kg	8270C	08/07/13	1
Pyrene	BDL	0.037	mg/kg	8270C	08/07/13	1
Surrogate Recovery						
Nitrobenzene-d5	119.		% Rec.	8270C	08/07/13	1
2-Fluorobiphenyl	108.		% Rec.	8270C	08/07/13	1
p-Terphenyl-d14	108.		% Rec.	8270C	08/07/13	1
Polychlorinated Biphenyls						
PCB 1016	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1221	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1232	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1242	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1248	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1254	BDL	0.019	mg/kg	8082	08/06/13	1
PCB 1260	BDL	0.019	mg/kg	8082	08/06/13	1
PCBs Surrogates						
Decachlorobiphenyl	73.8		% Rec.	8082	08/06/13	1
Tetrachloro-m-xylene	88.0		% Rec.	8082	08/06/13	1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



Sample ID

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Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-20

Date Received : August 03, 2013

: North Royalton Phase II ESA Description : MW-06 8-10FT

Site ID :

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	85.9	0.100	90	2540 G-2011	08/08/13	1
TPHG C6 - C12 Surrogate Recovery-%	BDL	0.58	mg/kg	8015	08/07/13	5
a,a,a-Trifluorotoluene(FID)	95.1		% Rec.	8015	08/07/13	5
Benzene Toluene Ethylbenzene Total Xylenes Methyl tert-butyl ether Surrogate Recovery Toluene-d8 Dibromofluoromethane 4-Bromofluorobenzene	BDL BDL BDL BDL BDL 96.0 92.3 97.3	0.0058 0.029 0.0058 0.017 0.0058	mg/kg mg/kg mg/kg mg/kg mg/kg * Rec. * Rec.	8260B 8260B 8260B 8260B 8260B 8260B 8260B 8260B	08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13	5 5 5 5 5 5
Ohio DRO C10-C20 Hydrocarbons C20-C34 Hydrocarbons Surrogate Recovery o-Terphenyl	BDL BDL 83.2	4.6 4.6	mg/kg mg/kg % Rec.	8015M 8015M 8015M	08/09/13 08/09/13 08/09/13	1 1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-21

Project # : C3210006

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Sample ID : B-07 4-6FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	83.9	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12 Surrogate Recovery-%	100	60.	mg/kg	8015	08/07/13	500
a,a,a-Trifluorotoluene(FID)	97.2		% Rec.	8015	08/07/13	500
Benzene Toluene Ethylbenzene Total Xylenes Methyl tert-butyl ether Surrogate Recovery Toluene-d8 Dibromofluoromethane 4-Bromofluorobenzene	0.39 BDL 3.1 7.6 BDL 97.5 99.0 98.3	0.060 0.30 0.060 0.18 0.060	mg/kg mg/kg mg/kg mg/kg mg/kg Rec. % Rec. % Rec.	8260B 8260B 8260B 8260B 8260B 8260B 8260B 8260B	08/07/13 08/07/13 08/07/13 08/07/13 08/07/13 08/07/13 08/07/13	50 50 50 50 50 50
Ohio DRO C10-C20 Hydrocarbons C20-C34 Hydrocarbons Surrogate Recovery o-Terphenyl	17. BDL 83.0	4.8 4.8	mg/kg mg/kg % Rec.	8015M 8015M 8015M	08/09/13 08/09/13 08/09/13	1 1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-22

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Project # : C3210006

Sample ID : B-08 4-6FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	81.2	0.100	૪	2540 G-2011	08/08/13	1
TPHG C6 - C12 Surrogate Recovery-%	8.0	0.62	mg/kg	8015	08/07/13	5
a,a,a-Trifluorotoluene(FID)	96.4		% Rec.	8015	08/07/13	5
Benzene Toluene Ethylbenzene Total Xylenes Methyl tert-butyl ether Surrogate Recovery Toluene-d8 Dibromofluoromethane 4-Bromofluorobenzene	0.018 BDL 0.22 0.28 BDL 97.3 93.8 101.	0.0062 0.031 0.0062 0.018 0.0062	mg/kg mg/kg mg/kg mg/kg mg/kg * Rec. * Rec.	8260B 8260B 8260B 8260B 8260B 8260B 8260B 8260B	08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13	5 5 5 5 5 5
Ohio DRO C10-C20 Hydrocarbons C20-C34 Hydrocarbons Surrogate Recovery o-Terphenyl	8.4 BDL 80.3	4.9 4.9	mg/kg mg/kg % Rec.	8015M 8015M 8015M	08/09/13 08/09/13 08/09/13	1 1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



Sample ID

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REPORT OF ANALYSIS

Mr. Matt Danus The Mannik and Smith Group, Inc.

23225 Mercantile Rd. Beachwood, OH 44122

August 14,2013

ESC Sample # : L650036-23

Date Received : August 03, 2013

: North Royalton Phase II ESA Description : B-09 6-8FT

Site ID :

Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	84.7	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12	450	5.9	mg/kg	8015	08/08/13	50
Surrogate Recovery-%			3. 3			
a,a,a-Trifluorotoluene(FID)	96.7		% Rec.	8015	08/08/13	50
Volatile Organics						
Acetone	BDL	0.30	mg/kg	8260B	08/06/13	5
Acrylonitrile	BDL	0.059	mg/kg	8260B	08/06/13	5
Benzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromodichloromethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromoform	BDL	0.0059	mg/kg	8260B	08/06/13	5
Bromomethane	BDL	0.030	mg/kg	8260B	08/06/13	5
n-Butylbenzene	0.051	0.0059	mg/kg	8260B	08/06/13	5
sec-Butylbenzene	0.020	0.0059	mg/kg	8260B	08/06/13	5
tert-Butylbenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Carbon tetrachloride	BDL	0.0059	mg/kg	8260B	08/06/13	5
Chlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Chlorodibromomethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Chloroethane	BDL	0.030	mg/kg	8260B	08/06/13	5
2-Chloroethyl vinyl ether	BDL	0.30	mg/kg	8260B	08/06/13	5
Chloroform	BDL	0.030	mg/kg	8260B	08/06/13	5
Chloromethane	BDL	0.015	mg/kg	8260B	08/06/13	5
2-Chlorotoluene	BDL	0.0059	mg/kg	8260B	08/06/13	5
4-Chlorotoluene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2-Dibromo-3-Chloropropane	BDL	0.030	mg/kg	8260B	08/06/13	5
1,2-Dibromoethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
Dibromomethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2-Dichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,3-Dichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,4-Dichlorobenzene	BDL	0.0059	mg/kg	8260B	08/06/13	5
Dichlorodifluoromethane	BDL	0.030	mg/kg	8260B	08/06/13	5
1,1-Dichloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,2-Dichloroethane	BDL	0.0059	mg/kg	8260B	08/06/13	5
1,1-Dichloroethene	BDL	0.0059	mg/kg	8260B	08/06/13	5
cis-1,2-Dichloroethene	BDL	0.0059		8260B	08/06/13	5
trans-1,2-Dichloroethene	BDL	0.0059	mg/kg	8260B 8260B		5 5
			mg/kg		08/06/13	5 5
1,2-Dichloropropane 1,1-Dichloropropene	BDL BDL	0.0059 0.0059	mg/kg	8260B 8260B	08/06/13	5 5
			mg/kg		08/06/13	
1,3-Dichloropropane	BDL	0.0059	mg/kg	8260B	08/06/13	5 5
cis-1,3-Dichloropropene	BDL	0.0059	mg/kg	8260B	08/06/13	
trans-1,3-Dichloropropene	BDL	0.0059	mg/kg	8260B	08/06/13	5
2,2-Dichloropropane	BDL	0.0059	mg/kg	8260B	08/06/13	5

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:

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12065 Lebanon Rd. Mt. Juliet, TN 37122 (615) 758-5858 1-800-767-5859

Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-23

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Sample ID : B-09 6-8FT

Project # : C3210006

Collected By : Collection Date : Jamie B

07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Di-isopropyl ether Ethylbenzene Hexachloro-1,3-butadiene Isopropylbenzene p-Isopropyltoluene 2-Butanone (MEK) Methylene Chloride 4-Methyl-2-pentanone (MIBK) Methyl tert-butyl ether Naphthalene n-Propylbenzene Styrene 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane 1,1,2-Trichlorotrifluoroethane Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane 1,2,3-Trichloroethane 1,1,2-Trichloroethane 1,2,3-Trichloroethane 1,2,1-Trichloroethane 1,2,3-Trichloropropane 1,2,3-Trichloropropane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene	BDL 0.021 BDL 0.015 0.010 BDL BDL BDL BDL BDL BDL BDL BDL	0.0059 0.0059 0.0059 0.0059 0.0059 0.0059 0.030 0.0059 0.0059 0.0059 0.0059 0.0059 0.0059 0.0059 0.0059 0.0059 0.0059 0.0059 0.0059	mg/kg	8260B 8260B	08/06/13 08/06/13	55555555555555555555555555555555
1,2,3-Trimethylbenzene Vinyl chloride 1,3,5-Trimethylbenzene Xylenes, Total	0.059 BDL 0.031 0.024	0.0059 0.0059 0.0059 0.018	mg/kg mg/kg mg/kg mg/kg	8260B 8260B 8260B 8260B	08/06/13 08/06/13 08/06/13 08/06/13	5 5 5 5
Surrogate Recovery Toluene-d8 Dibromofluoromethane 4-Bromofluorobenzene	57.9 93.1 114.		% Rec. % Rec. % Rec.	8260B 8260B 8260B	08/06/13 08/06/13 08/06/13	5 5 5
Ohio DRO C10-C20 Hydrocarbons C20-C34 Hydrocarbons Surrogate Recovery	4.8 BDL	4.7 4.7	mg/kg mg/kg	8015M 8015M	08/09/13 08/09/13	1
o-Terphenyl	75.4		% Rec.	8015M	08/09/13	1
Polynuclear Aromatic Hydrocarbons Anthracene Acenaphthene Acenaphthylene	BDL BDL BDL	0.039 0.039 0.039	mg/kg mg/kg mg/kg	8270C 8270C 8270C	08/07/13 08/07/13 08/07/13	1 1 1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Fax (615) 758-5859

Tax I.D. 62-0814289

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd.

Beachwood, OH 44122

ESC Sample # : L650036-23

Project # : C3210006

Est. 1970

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

Sample ID : B-09 6-8FT

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Benzo(a)anthracene	BDL	0.039	mg/kg	8270C	08/07/13	1
Benzo(a)pyrene	BDL	0.039	mg/kg	8270C 8270C	08/07/13	1
Benzo(b)fluoranthene	BDL	0.039	mg/kg	8270C	08/07/13	1
Benzo(g,h,i)perylene	BDL	0.039	mg/kg	8270C	08/07/13	1
Benzo(k)fluoranthene	BDL	0.039	mg/kg	8270C	08/07/13	1
Chrysene	BDL	0.039	mg/kg	8270C	08/07/13	1
Dibenz(a,h)anthracene	BDL	0.039	mg/kg	8270C	08/07/13	1
Fluoranthene	BDL	0.039	mg/kg	8270C 8270C	08/07/13	1
Fluorene	BDL	0.039	mg/kg	8270C	08/07/13	1
Indeno(1,2,3-cd)pyrene	BDL	0.039	mg/kg	8270C 8270C	08/07/13	1
Naphthalene	0.38	0.039	mg/kg	8270C	08/07/13	1
Phenanthrene	BDL	0.039	mg/kg	8270C	08/07/13	1
Pyrene	BDL	0.039	mg/kg	8270C	08/07/13	1
Surrogate Recovery	ВОП	0.035	mg/kg	02700	00/07/13	_
Nitrobenzene-d5	121.		% Rec.	8270C	08/07/13	1
2-Fluorobiphenyl	103.		% Rec.	8270C	08/07/13	1
p-Terphenyl-d14	102.		% Rec.	8270C 8270C	08/07/13	1
p respicify dia	102.		· Rec.	02700	00/07/13	_
Polychlorinated Biphenyls						
PCB 1016	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1221	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1232	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1242	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1248	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1254	BDL	0.020	mg/kg	8082	08/06/13	1
PCB 1260	BDL	0.020	mg/kg	8082	08/06/13	1
PCBs Surrogates						
Decachlorobiphenyl	73.8		% Rec.	8082	08/06/13	1
Tetrachloro-m-xylene	84.1		% Rec.	8082	08/06/13	1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:



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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

August 14,2013

Mr. Matt Danus The Mannik and Smith Group, Inc. 23225 Mercantile Rd. Beachwood, OH 44122

ESC Sample # : L650036-24

Date Received : August 03, 2013

: North Royalton Phase II ESA Description

Site ID :

: B-10 8-10FT Sample ID Project # : C3210006

Collected By : Jamie B
Collection Date : 07/31/13 00:00

Parameter	Dry Result	Det. Limit	Units	Method	Date	Dil.
Total Solids	84.6	0.100	%	2540 G-2011	08/08/13	1
TPHG C6 - C12 Surrogate Recovery-%	BDL	0.59	mg/kg	8015	08/09/13	5
a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015	08/09/13	5
Benzene Toluene Ethylbenzene Total Xylenes Methyl tert-butyl ether Surrogate Recovery Toluene-d8 Dibromofluoromethane 4-Bromofluorobenzene	BDL BDL BDL BDL BDL 97.2 92.3 97.6	0.0059 0.030 0.0059 0.018 0.0059	mg/kg mg/kg mg/kg mg/kg mg/kg sec. Rec. Rec.	8260B 8260B 8260B 8260B 8260B 8260B 8260B 8260B	08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13 08/06/13	5 5 5 5 5 5
Ohio DRO C10-C20 Hydrocarbons C20-C34 Hydrocarbons Surrogate Recovery o-Terphenyl	BDL BDL 81.8	4.7 4.7	mg/kg mg/kg % Rec.	8015M 8015M 8015M	08/09/13 08/09/13 08/09/13	1 1

Results listed are dry weight basis. BDL - Below Detection Limit Det. Limit - Practical Quantitation Limit(PQL)

Note:

# Attachment A List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L650036-06 L650036-23	WG675595 WG675535 WG675535 WG675535 WG675535 WG675535	SAMP SAMP SAMP SAMP SAMP SAMP	2-Chloroethyl vinyl ether 2-Chloroethyl vinyl ether 2-Butanone (MEK) 1,1,2-Trichloroethane 1,2,4-Trimethylbenzene Toluene-d8	R2770420 R2770362 R2770362 R2770362 R2770362 R2770362	J3 J3 J5 J5 J5 J6

# Attachment B Explanation of QC Qualifier Codes

Qualifier	Meaning
Ј2	Surrogate recovery limits have been exceeded; values are outside lower control limits
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

#### Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

#### Definitions

- Accuracy The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision The agreement between a set of samples or between duplicate samples.

  Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Company Name/Address:			Billing Info	ormation:	Billing Information:					Analysis /	Contai	ner / Pre	eservati	ive	*		Chain of Custody	Page Z of
Mannik Smith Group 23225 Mercantile Road Beachwood Ohio			same											6			E-A-B S-C	SC
Report to:  Matt Danus			Email To:	ıs@manniksı	mithgroup.c	om											12065 Lebanon Rd Mount Juliet, TN 371 Phone: 615-758-5858 Phone: 800-767-5859	22
Project Description: North Royalton	Phase II ESA	4		City/State Collected; Nor	th Royalton	ОН											Fax: 615-758-5859	
Phone: <b>2164018878</b> Fax:	Client Project			Lab Project #								4					L# 656	036
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Collected by (signature):  Immediately Packed on Ice N Y	Same [ Next D Two Da	Lab MUST Be Day Day Day	200% 100% 50%	Email?	_No ✓_Yes NoYes	No.	OCS	BTEX/MT	4Hs								Prelogin: TSR: PB:	
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FB 073113		OT		- 2		1		- 1	X	-		94.1					- 4	-03
MW-01		GW				2		X										- OH
MW-02		-	7 -	-		2		X							0.44			-05
MW-63						4	X		X									-04
MW-04						2		X				9						707
MW-65			N. O. VI.			4	X		X			7					- Falsa sa Ch	-00
MW-06					Total Control	2		X		~	100			Standard Andrews		, <u>4</u>		-09
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Mannik Smith Group						. 4											3	JC.
23225 Mercantile Road																	L·A·B S·C	I.E.N.C.
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Report to:			Email To:														12065 Lebanon Rd Mount Juliet, TN 3712	
Matt Danus			mdanu		mithgroup.co												Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859	
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Phone: 2164018878 Fax:	Client Project			Lab Project #		with .	8							***			Table #	J <b>O</b>
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EB 080213	- Dig	OT				2	X	100				1 7					4	-11
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TB 08 0213		Tolank	i i	* * *		2	X											-13
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	· · · · · · · · · · · · · · · · · · ·	· ***				-2/8				nU		Ton	'n		14			
* Matrix: SS - Soil GW - Groundwater	WW - WasteV	Vater <b>DW</b> - Di	rinking Wat	er OT - Other			260			pH _		Ten			LI.	old#		
Remarks:				5	5040 0	02	92	16	360	Flow _		1	13. 3.5		16		11-15	use only)
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Same   Mannik Smith Group   3225 Mercantile Road   Beachwood Ohio			Billing	ng Informa	ation:		0 100	48 X		An	alysis / (	Containe	er / Prese	rvative	7.6	F 1774	Chain of Custody	Page 1 of 3
Email To:   mdanus@manniksmithgroup.com   City/State   North Royalton OH   Description:   North Royalton Phase   I ESA   Cilletted: North Royalton OH   Collected: North Royalton OH																	TW)	SC
Matrixix   SS-Soli GW-Groundwater WW-WasteWater DW-Drinking Water OT-Other							A									7.	L.A.B S.C	OF CHOICE
North Royalton Phase     ESA		and the second			ത manniksmi	itharoup co	om										Mount Juliet, TN 371 Phone: 615-758-585 Phone: 800-767-585	27% P
Phone: 2164018878 Ca210006  Collected by (print):  Jamie B.  Collected by (signature):    Rush? (Lab MUST Be Notified)	e II ESA	se II ESA	Imac		12	TO VERNING TO THE PARTY OF THE			072		8015						Fax: 615-758-5859	
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MW-03 & 8							1	1	X		X							-/
MW-04 /0-12  MW-05 27-24  MW-06 8-10  B-07 4-6  B-08 4-6  B-09 6-8  B-10 8-10  *Matrix: \$5-Soil GW-Groundwater WW-WasteWater DW-Drinking Water OT-Other  pH							2	X		X		X					24	-1
MW-05 22-24  MW-06 8-10  B-07 4-6  B-08 4-6  B-09 6-8  B-10 8-10  *Matrix: SS-Soil GW-Groundwater WW-WasteWater DW-Drinking Water OT-Other  pH							1		X		X							-1
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B-07       4-6         B-08       4-6         B-09       6-8         B-10       8-10         * Matrix: SS-Soil GW-Groundwater WW-WasteWater DW-Drinking Water OT-Other							1		X		X			ALIKO ZI				-1
B-08       4-6         B-09       6-8         B-10       8-10         * Matrix: SS-Soil GW-Groundwater WW-WasteWater DW-Drinking Water OT-Other					*2125 *0.11		2		X		X		•			M 型型		-2
B-09       6-8         B-10       8-10         * Matrix: SS-Soil GW-Groundwater WW-WasteWater DW-Drinking Water OT-Other			4000	44			2	2	X		X				Je A			-0
B-10 8-10  * Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other  pH				94			7	X		X	X	X						-2
* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water O1 - Other							1		X		X		1 900				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-2
Demosks:	<b>/W</b> - WasteWate	<b>ww</b> - WasteWate	<b>W</b> - Drinkin	king Water	r <b>OT</b> - Other					· • ·	i .					Hold #		
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# APPENDIX D WELL DEVELOPMENT & SAMPLING FORMS





## Well Development Data Log

Project #:	C321006	-	t Informat		Διιαμε	t 1, 2013		
Site Name:	North Royalton, Vacant G	as Station			Telephone #:			
	Present:			_ JNB	тетерионе #.			
Regulatory Obse	erver(s):			None				
	Sunny, Windy				nperature °F:		80	
				<u> </u>				
	Field Instrumentation				Mor	nitoring We	II Data	
Static Water Le	evel Measurement: Her	on H.01L		Groun	d Surface Ele	_		
	r(s) Measurement:			Тор	of Casing Ele	v.:		
Measurement of	Field Parameters: IQ / LaM	lotte / ExTech	_		ınd Water Ele	., .		
	Peristaltic Pump:		-	Hyd	raulic Locatio			
Well Condition/Evider	Ance of Tampering:	Additional M	_	Well Data	l	Wal	l Diameter:	1 inch
Monitoring Purpose:			HOHE				i Diameter.	1 111011
		t.) -	Static W	ater Level:	13	.87	(ft.)	
	<b>Column:</b> 13.66 (fi							•
Immiscible Layer(s) F		<u> </u>	Monitor Well	Volume/foot	Height of Water	Volume of		Minimum Vol
Top of Layer:	NA (ft	t.)	Diameter	of Water	Column	Water Column		to Purge (gal
Bottom of Layer:	NA (ft	t.)	1 (in)	0.041 (gal) x	13.66 (ft)	= 0.56		
Thickness:	NA (fi	<del></del> t.)						
Immiscible Layer(s) Sa	ampled: Not Applicable	<del></del>						
	Mo	onitoring We	ell Develo	oment Da	ta			
Purging Device:	Bailer/Pump		Time	Vol. Purged		рН	Conductivity	Turbidity
Purging Start Time:	14:35	Well Volumes		(gal)	(°F)	(S.U.)	(μS/cm)	(NTU)
	15:15	Initial	2:35	0.50				Brown
	Purged: 5.00	1	2:40	1.00				Brown
		2	2:45	1.50				Brown
Sampling Device:		3	2:50	2.50				Brown
Time of Sampling:		4	3:00	3.00				ight Brown/Clo
Second Attempt:	am/pm	5	3:05	4.00				ight Brown/Clo
Third Attempt:	am/pm	6	3:10	4.50				ight Brown/Clo
Fourth Attempt:	am/pm	Final	3:15	5.00				
Fifth Attempt:	am/pm							
		Co	omments					
-								



#### Well Development Data Log

		Projec	t Informat	ion				
Project #:	C3210006				August	1, 2013		
	North Royalton, Vacant	Gas Station						
MSG Personnel P	resent:			JNB				
Regulatory Obser	rver(s):			None				
Weather Conditions:	Sunny, Windy	•		Ten	perature °F:		80	
	Field Instrumentation				Mor	itoring We	II Data	
Static Water Lev	vel Measurement: He	eron H.01L		Ground	d Surface Ele	v.:		
Immiscible Layer	(s) Measurement:			Тор	of Casing Ele	v.:		
Measurement of I	Field Parameters:	Hanna		Grou	nd Water Ele	v.:		
	Peristaltic Pump:			Hydr	aulic Locatio	n:		
		Additional M	onitoring	Well Data				
Well Condition/Eviden	ce of Tampering:		Excellent / n			Well	Diameter:	1 inch
					vestigation		•	·
		(ft.) -			11	.59	(ft.)	
= Height of Water C	olumn: 15.84	(ft.)						
Immiscible Layer(s) P	resent:		Monitor Well		Height of Water	Volume of		Minimum Vol.
Top of Layer:		(ft.)	Diameter	of Water	Column	Water Column		to Purge (gal)
Bottom of Layer:		(ft.)	1 (in)	0.041 (gal) x	15.84 (ft)	= 0.64		
Thickness:		(ft.)						
Immiscible Layer(s) Sa	mpled:							
	N	Ionitoring We	II Develor	ment Dat	a			
Purging Device:	Bailer/pump	Well Volumes	Time	Vol. Purged	Temperature	рН	Conductivity	Turbidity
Purging Start Time:	1:40pm	well volullies		(gal)	(°C)	(S.U.)	(μS/cm)	(NTU)
Purging Stop Time:	2:30pm	Initial	1:45	0.50				Brown
Total Gallons P	urged: 5.00	1	1:50	1.00				Brown
Well Yield:		2	1:55	1.50				Brown
Sampling Device:		3	2:00	2.00				ight Brown/Cloud
Time of Sampling:	am/pm	4	2:05	2.50				Cloudy
Second Attempt:	am/pm	5	2:10	3.00				Clear
Third Attempt:	am/pm	6	2:15	3.50				Clear
		7	2:20	4.00				Clear
Fourth Attempt:	am/pm	8	2:25	4.50				Clear
	om/nm	Final	2:30	5.00				Clear
Fifth Attempt:	am/pm_							
Fifth Attempt:	ашурш							
Fifth Attempt:	апирпп	Сс	mments					
Fifth Attempt:	апирпп	Co	omments					
Fifth Attempt:	апурп	Co	omments					
Fifth Attempt:	апирп	Co	omments					
Fifth Attempt:	апирпп	Co	omments					
Fifth Attempt:	апирпп	Cc	omments					
Fifth Attempt:	апирпп	Co	omments					



#### Well Development Data Log

		Projec	t Informat	ion				
Project #:	C3210006	-			August	1. 2013		
	Strongsville	24101			Telephone #:			
MSG Personnel P				JNB				
Regulatory Obse				None				
	Sunny, Windy				nperature °F:		80	
	Fig. 111 and a second of the					** * <b>\A</b> / -	U.D4-	
<b>.</b>	Field Instrumentation			_		itoring We		
		ron H.01L	<del>-</del>	Ground	d Surface Ele	v.:		
	(s) Measurement:		<del>-</del>	Тор	of Casing Ele	v.:		
	Field Parameters:	Horiba	=	Grou	ind Water Ele	v.:		
	Peristaltic Pump:		-	Hydi	raulic Locatio	n:		
		Additional M	_	Well Data				
	ce of Tampering:		None			Wel	I Diameter:	1 inch
Monitoring Purpose:	27.22			evelop				
Total Depth (from TOC):	27.23 (	ft.) -	Static W	ater Level:	13.	51	(ft.)	
= Height of Water C	olumn: 13.74 (	ft.)						
Immiscible Layer(s) P	resent: No		Monitor Well		Height of Water			Minimum Vol.
Top of Layer:	(	ft.)	Diameter	of Water	Column	Water Column		to Purge (gal)
Bottom of Layer:		ft.)	1 (in)	0.041 (gal) x	13.74 (ft)	= 0.56		
Thickness:		ft.)	2 (in)	0.163(gal) x	(ft)	=		=
Immiscible Layer(s) Sa	mpled:							
	M	onitoring We	ell Develor	oment Da	ta			
Purging Device:			Timo	Vol. Purged		pН	Conductivity	Turbidity
		Well Volumes		(gal)	(°F)	(S.U.)	(μS/cm)	(NTU)
Purging Stop Time:	11:35 12:15	Initial	11:30	0.50	( )	( )		Brown
	Purged: 5.00	1	11:35	1.00				Brown
Well Yield:		2	11:40	1.50				Brown
Sampling Device:		3	11:45	2.00				Brown
Time of Sampling:	am/pm	4	11:50	2.50				Brown
Second Attempt:	am/pm	5	11:55	3.00				Light Brown
Third Attempt:	am/pm	6	12:00	3.50				Cloudy
		7	12:05	4.00				Cloudy
Fourth Attempt:	am/pm	8	12:10	4.50				Cloudy
Fifth Attempt:	am/pm	Final	12:15	5.00				Cloudy
								-
		Co	omments					
-								
·								



#### Well Development Data Log

Project #: C3210006 Site Name: North Royalton, Vacant				<u> </u>						
	Gas Station			Telephone #:						
MSG Personnel Present:			JNB							
Regulatory Observer(s):			None							
Weather Conditions: Sunny			Ten	nperature °F:		pH Conductivity Turbidi (S.U.) (mS/cm) (NTU ght Brown, ight Brown,				
Field Instrumentation				Mor	itoring We	II Data				
Static Water Level Measurement: He	eron H.01L	_	Ground	d Surface Ele	v.:					
Immiscible Layer(s) Measurement:		_								
Measurement of Field Parameters:   IQ / La	Motte / ExTech	_								
Peristaltic Pump:			Hydı	raulic Locatio						
	Additional M	onitoring	Well Data							
Well Condition/Evidence of Tampering:		None			Wel	l Diameter:	1 inch			
Monitoring Purpose:			evelop							
	(ft.) -	Static W	ater Level:	12.	.58	(ft.)				
= Height of Water Column: 14.67	(ft.)									
Immiscible Layer(s) Present: No				Height of Water			Minimum Vol			
minisolate Edycr(s) i resent:	(f. )	Diameter	of Water	Column	Water Column		to Purge (gal			
	(ft.)				0.00					
Top of Layer: NA	(ft.)	1 (in)	0.041 (gal) x	14.67 (ft)	= 0.60					
Top of Layer: NA Bottom of Layer: NA		1 (in) 2(in)	0.041 (gal) x 0.163(gal) x		= 0.60					
Top of Layer: NA  Bottom of Layer: NA  Thickness: NA  Immiscible Layer(s) Sampled: Not Applicable	(ft.)	2(in)	0.163(gal) x	(ft)						
Top of Layer: NA  Bottom of Layer: NA  Thickness: NA  Immiscible Layer(s) Sampled: Not Applicable  Purging Device: Bailer/pump	(ft.) (ft.)  Ionitoring We	2(in)	0.163(gal) x	(ft)	=		Turbidity			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time:  NA  NA  NA  Not Applicable  Not Applicable  10:30am	(ft.) (ft.)	2(in)  ell Develop  Time	O.163(gal) x  Oment Date  Vol. Purged  (gal)	(ft)	=		Turbidity (NTU)			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: NA  NA  Not Applicable  Not Applicable  10:30am  11:20	(ft.) (ft.)  Ionitoring We	2(in)	0.163(gal) x  oment Dat  Vol. Purged	(ft)	= pH					
Top of Layer: NA  Bottom of Layer: NA  Thickness: NA  Immiscible Layer(s) Sampled: Not Applicable  Purging Device: Bailer/pump  Purging Start Time: 10:30am  Purging Stop Time: 11:20  Total Gallons Purged: 5.00	(ft.) (ft.)  Ionitoring We Well Volumes Initial 1	2(in)  ell Develop  Time	O.163(gal) x  Oment Date  Vol. Purged  (gal)	(ft)	= pH		(NTU)  Brown ight Brown/Clo			
Top of Layer: NA  Bottom of Layer: NA  Thickness: NA  Immiscible Layer(s) Sampled: Not Applicable  Purging Device: Bailer/pump  Purging Start Time: 10:30am  Purging Stop Time: 11:20  Total Gallons Purged: 5.00  Well Yield:	Ionitoring We Well Volumes Initial 1 2	2(in)  Pell Develop  Time  10:30	O.163(gal) x  Description of the content of the con	(ft)	= pH		(NTU)  Brown ight Brown/Clo			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: Total Gallons Purged: Sampling Device: Sampling Device:	(ft.) (ft.) (ft.)  Ionitoring We Well Volumes Initial 1 2 3	2(in)  Pell Develop Time  10:30 10:35 10:40 10:45	0.163(gal) x  Oment Dat  Vol. Purged (gal)  0.50  1.00  1.25  1.50	(ft)	= pH		(NTU)  Brown  ight Brown/Clo  ight Brown/Clo  ight Brown/Clo			
Top of Layer: Bottom of Layer: Thickness: NA  Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: Total Gallons Purged: Sampling Device: Sampling Device: Time of Sampling:  NOT Applicable  Not Applicable  Not Applicable  Not Applicable  10:30am  11:20  5.00  Well Yield: Sampling Device: Time of Sampling:  am/pm	(ft.) (ft.) (ft.)  Ionitoring We Well Volumes Initial 1 2 3 4	2(in)  Pell Develop  Time  10:30  10:35  10:40  10:45  10:50	0.163(gal) x  Description of the content of the con	(ft)	= pH		(NTU)  Brown  ight Brown/Clo  ight Brown/Clo  ight Brown/Clo  ight Brown/Clo			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: Total Gallons Purged: Sampling Device: Time of Sampling: Second Attempt:  NA NA NA NOT Applicable Not Applicable  Not Applicable	(ft.) (ft.) (ft.) (ft.)  Well Volumes  Initial 1 2 3 4 5	2(in)  2(in)  Time  10:30 10:35 10:40 10:45 10:50 10:55	0.163(gal) x  Description of the content of the con	(ft)	= pH		(NTU)  Brown  ight Brown/Clc  ight Brown/Clc  ight Brown/Clc  ight Brown/Clc  ight Brown/Clc			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: Total Gallons Purged: Sampling Device: Time of Sampling: Second Attempt: Third Attempt:  NA NA NA NA NOT Applicable  Am/pam  am/pm  am/pm	(ft.) (ft.) (ft.) (ft.)  Well Volumes  Initial  1  2  3  4  5  6	2(in)  2(in)  Time  10:30  10:35  10:40  10:45  10:50  10:55  11:00	0.163(gal) x  Oment Date  Vol. Purged (gal)  0.50  1.00  1.25  1.50  2.00  2.50  3.00	(ft)	= pH		(NTU)  Brown  ight Brown/Clc  ight Brown/Clc  ight Brown/Clc  ight Brown/Clc  ight Brown/Clc  ight Brown/Clc			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: Total Gallons Purged: Sampling Device: Time of Sampling: Second Attempt:  NA NA NA NOT Applicable Not Applicable  Not Applicable	(ft.) (ft.) (ft.) (ft.)    Ionitoring We   Well Volumes	2(in)  Pell Develop  Time  10:30  10:35  10:40  10:45  10:50  10:55  11:00  11:05	0.163(gal) x  Oment Date  Vol. Purged (gal) 0.50 1.00 1.25 1.50 2.00 2.50 3.00 3.50	(ft)	= pH	(mS/cm)	(NTU)  Brown  ight Brown/Clc			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: Total Gallons Purged: Sampling Device: Time of Sampling: Second Attempt: Third Attempt:  NA NA NA NA NOT Applicable  Am/pam  am/pm  am/pm	(ft.) (ft.) (ft.) (ft.)  Ionitoring We  Well Volumes  Initial  2  3  4  5  6  7  8	2(in)  Pell Develop Time  10:30 10:35 10:40 10:45 10:50 11:00 11:05 11:10	0.163(gal) x  Oment Date  Vol. Purged (gal)  0.50  1.00  1.25  1.50  2.00  2.50  3.00  3.50  4.00	(ft)	= pH	(mS/cm)	(NTU)  Brown  ight Brown/Clo  ight Brown/Clo			
Top of Layer: Bottom of Layer: Thickness: Immiscible Layer(s)  Purging Device: Purging Start Time: Purging Stop Time: Total Gallons Purged: Sampling Device: Time of Sampling: Second Attempt: Third Attempt:  NA NA NA NA NOT Applicable  Am/pam  am/pm  am/pm	(ft.) (ft.) (ft.) (ft.)    Ionitoring We   Well Volumes	2(in)  Pell Develop  Time  10:30  10:35  10:40  10:45  10:50  10:55  11:00  11:05	0.163(gal) x  Oment Date  Vol. Purged (gal) 0.50 1.00 1.25 1.50 2.00 2.50 3.00 3.50	(ft)	= pH	(mS/cm)	(NTU)  Brown  ight Brown/Clo			



#### Well Development Data Log

		-	t Informat					
Project #:					August			
	North Royalton, Vacant Ga				Telephone #:			
MSG Personnel	Present:			JNB				
	erver(s):			None	<sup>0</sup> F.			
Weather Conditions:	Cloudy			ı en	nperature °F:		68	
	Field Instrumentation					nitoring We		
Static Water Lo	evel Measurement: Hero	n H.01L	_	Ground	d Surface Ele	v.:		
Immiscible Laye	er(s) Measurement:		_	Тор	of Casing Ele	v.:		
Measurement of	f Field Parameters: IQ / LaMo	otte / ExTech	_	Grou	ınd Water Ele	v.:		
	Peristaltic Pump:		=	Hydi	raulic Locatio	n:		
	A	dditional M	onitoring	Well Data				
Well Condition/Evide	ence of Tampering:		_			Well	Diameter:	1 inch
	. •			evelop				
Total Depth (from TOC):		<u> </u>	Static W	ater Level:	14	.37	(ft.)	
	<b>Column:</b> 12.36 (ft.	_						
Immiscible Layer(s)	Present: No		Monitor Well	Volume/foot	Height of Water	Volume of		Minimum Vol.
Top of Layer:	NA (ft.	)	Diameter	of Water	Column	Water Column		to Purge (gal)
Bottom of Layer:	NA (ft.	)	1 (in)	0.041 (gal) x	12.36 (ft)	= 0.50		
Thickness:	NA (ft.	<u>)</u>	2(in)	0.163 (gal) x	(ft)	=		
Immiscible Layer(s) S	ampled: Not Applicable	_						
	Мо	nitoring We	ell Develor	oment Da	ta			
Purging Device:	Bailer/pump		Time	Vol. Purged		рН	Conductivity	Turbidity
	9:30	Well Volumes		(gal)	(°F)	(S.U.)	(mS/cm)	(NTU)
Purging Stop Time:	10:15	Initial	9:30	0.50				Brown
Total Gallons	Purged: 4.50	1	9:35	1.00				Brown
Well Yield:		2	9:40	1.50				Brown
Sampling Device:		3	9:45	1.75				Brown
Time of Sampling:	am/pm	4	9:50	2.00				Brown
Second Attempt:	am/pm	5	9:55	2.50				Brown
Third Attempt:	am/pm	6	10:00	3.00				Cloudy
Fourth Attempt:	am/pm_	7	10:05	3.50				Cloudy
_		8	10:10	4.00				Clear
Fifth Attempt:	am/pm	Final	10:15	4.50				Clear
		Co	omments					
-								
<u></u>								



## Well Development Data Log

		Proiec	t Informat	ion				
Project #:	C3210006	_			Augus	t 1, 2013		
Site Name:	North Royalton, Vacant Ga	as Station		•	Telephone #:	,		
MSG Personnel				JNB	•			
Regulatory Obs	server(s):			None				
Weather Conditions:	Sunny. Windy			Ten	nperature °F:		80	
	Field Instrumentation					nitoring We		
Static Water L	evel Measurement: Here	on H.01L	_	Ground	d Surface Ele	v.:		
	er(s) Measurement:		=	Тор	of Casing Ele	v.:		
Measurement of	of Field Parameters:	Horiba	=	Grou	ınd Water Ele	v.:		
	Peristaltic Pump:		_	Hydi	raulic Locatio	n:		
Wall Candition/Evid		Additional M	_	Well Data	l	Wal	l Diameter.	4:
	ence of Tampering:		none			wei	l Diameter:	1IN
Monitoring Purpose: _ Total Depth (from TOC):	21.12 #	-	Ctatio M	lotor I ovolu	25	05	(4.)	
= Height of Water			Static W	ater Level:		.95	(ft.)	-
<del>-</del>		. <u>.)</u>	Manitar Wall	Valuma/faat	Height of Water	Volume of		Minimum Val
Top of Laver:	Present:         No           NA         (ft	• )	Monitor Well Diameter	of Water	Column	Water Column		Minimum Vol to Purge (gal)
Top of Layer: _ Bottom of Layer:	NA (ft	<del></del>	1 (in)	0.041 (gal) x	5.18 (ft)	0.21	х3	=
Thickness:	NA (ft	<del>-</del>	1 (111)	0.041 (gai) X	3.10 (11)	0.21	λ3	
_	Sampled: Not Applicable	· <u>··)</u>						
	Mo	nitoring We	ell Develo	oment Da	ta			
	Bailer/Pump	Well Volumes	Time	Vol. Purged	Temperature	pН	Conductivity	Turbidity
Purging Start Time:				(gal)	(°F)	(S.U.)	(mS/cm)	(NTU)
- · · -	16:15	Initial	3:40					Brown/ Gray
	8 Purged: 1.25	1	3:45					Brown/ Gray
Well Yield:		2	3:50					Brown/ Gray
Sampling Device:		3	3:55					Light Brown
Time of Sampling: _		4	4:00					Light Brown
	am/pm	5	4:05					Light Brown
Third Attempt: _	am/pm	Final	4:10					Clear
Fourth Attempt:	am/pm							
Fifth Attempt:	am/pm_							
		C	omments					
						-		



Well ID

		_	_	_
М	W	/-	O	1

Donald at #	000400	.00		-	Information		A	0.0040		
Project #:			\ <u>\</u>				August	2, 2013		
Site Name:							Telephone #:			
MSG Personne	_					JNB				<del>.</del>
Regulatory Ob						None	0 <b>=</b>		00	
Weather Conditions:		Si	unny			I en	nperature °F:		66	
	Field I	nstrume	ntation				Mon	itoring Well	Data	
Static Water				1 H.01L		Ground	d Surface Elev	•		
Immiscible La					_		of Casing Elev			
Measurement					_	-	nd Water Elev			
Meddarement				er Masterflex	- F/S	Hvdi	raulic Locatio	n:		
			Odio i diffic	, madiomox	-	1.194		···		
			Ad	ditional Mo	onitoring V	Vell Data				
Well Condition/Evid	dence of Ta	mpering:			Excellent / ne			Well	Diameter:	1 inch
Monitoring Purpose:					shallow gro	undwater in	vestigation		-	
Total Depth (from TOC):		27.53	(ft.)	-	Static W	ater Level:	14.	05	(ft.)	
	= Height of Water Column: 13.48 (ft.)									
Immiscible Layer(s) Present:         No         Monitor Well         Volume/foot         Height of Water         Volume of										
Top of Layer:		NA			Diameter	of Water	Column	Water Column		
Bottom of Layer:			(ft.)		1 (in)	0.041 (gal) x	13.48 (ft)	= 0.55		
Thickness:		NA	(ft.)		2 (in)	0.163 (gal) x	` ′			
Immiscible Layer(s)	Sampled:	Not Ap	, ,		4 (in)	0.653 (gal) x				
			Monitor	ing Well Ρι	urging and	Sampling	g Data			
Purging Device:		Pump		Flow Rate	Time	Water Leve	Temperature	рН	Conductivity	Turbidity
Purging Start Time:		10:40		(mL/min)		(feet)	(°C)	(S.U.)	(mS/cm)	NTU
Purging Stop Time:		11:00		240	10:40	15.86	19.80	7.03	3.660	Little Cloudy
Total Gallon	s Purged:	1.50	)	125-150	10:50	15.96	21.70	6.24	3.800	Little Cloudy
Well Yield:					11:00	15.96				Clear
Sampling Device:		Bailer								
Time of Sampling:			11:05							
Second Attempt:			am/pm							
Third Attempt:			am/pm							
Fourth Attempt:			am/pm							
Fifth Attempt:			am/pm							
					4alman I f					
0I- ID	D			ample Con			No of Oo		B	
Sample ID MW-01	Param BTEX/N			tainer nber	Contain VO		No. of Co			ervative ICL
	,						_	-		
	Comments									
_										
Samples Shipped to:		C Lab Scie	nce	Via:			Matt	Danus		
Form Completed By:	Jamie Berardi	nelli								



	Project Information										
Project #:	C3210006		_			August	2, 2013				
Site Name:	North Royalton,	Vacant Gas				Telephone #:					
MSG Personne					JNB	•					
Regulatory Ob	oserver(s):				None						
Weather Conditions:		unny			Te	mperature °F:		66			
	Field Instrume	ntation					itoring Wel				
	Level Measurement:			_	Groun	d Surface Ele	v.:				
Immiscible La	yer(s) Measurement:			_	Тор	of Casing Ele	v.:				
Measurement	of Field Parameters:	Ho	oriba	_	Gro	und Water Ele	v.:				
	Peristaltic Pump:	Cole Parme	er Masterflex	E/S	Hyd	Iraulic Locatio	n:				
					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\						
			dditional N			3					
	dence of Tampering:			Excellent / r	none		Well	Diameter:	1 inch		
Monitoring Purpose:											
	27.43		-'	Static W	ater Level:	11.	60	(ft.)			
= Height of Water Column: 15.83 (ft.)											
	Immiscible Layer(s) Present: No Monitor Well Volume/foot Height of Water Volume of										
Top of Layer:		(ft.)		Diameter	of Water	Column	Water Column				
Bottom of Layer:			<u>-</u> '	1 (in)	0.041 (gal) x	7.25 (ft)					
Thickness:		(ft.)	•								
Immiscible Layer(s)	Sampled: Not Ap	plicable									
		Monitori	ing Well P	urging and	l Samnlin	n Data					
Purging Device:	Pump		Flow Rate	Time	Water Level	Temperature	nU.	Conductivity	Turkiditu		
Purging Start Time:			(mL/min)	rime	(ft)	(°C)	pH (S.U.)	(mS/cm)	Turbidity NTU		
Purging Stop Time:	10:20		300	10:00	15.11	16.90	7.07	3.220			
	ns Purged: 1.50	<u> </u>	240	10:05	15.11	16.90	7.07	3.220	Cloudy		
Well Yield:			125-150	10:03	14.21	17.50	7.88	3.000	Cloudy		
Sampling Device:			123-130	10:10	13.87	17.50	7.00	3.000	Cloudy		
	Danci	10.25		10.20	13.07						
Second Attempt:		am/pm									
Third Attempt:		am/pm									
Fourth Attempt:		am/pm									
Fifth Attempt:		am/pm									
T man / attompts		апирт									
		S	Sample Co	ntainer Inf	ormation						
Sample ID	Parameter	Con	tainer	Contain	er Size	No. of Co	ntainers	Prese	ervative		
MW-02 Dup080213	VOC		nber	VC		2			HCI		
Dup080213	BTEX/MTBE	An	nber	VC	AS	2		ŀ	HCI		
			С	omments							
	Comments										
Samples Shipped to:	Samples Shipped to: ESC Lab Science Via: Matt Danus										
Form Completed By:											
- z completed by:	Tamino Bordi dirioni										



	Project Information										
Project #:	C3210006		-			August	2, 2013				
	North Royalton,	Vacant Gas	Station			Telephone #:					
MSG Personne	el Present:				JNB, MN						
Regulatory Ol	oserver(s):				None						
Weather Conditions:	Sunny	, Cloudy			Ten	nperature °F:		63			
					· · · · · · · · · · · · · · · · · · ·						
	Field Instrume						itoring Wel				
	Level Measurement:		n H.01L	_	Ground	d Surface Ele	v.:				
Immiscible La	yer(s) Measurement:			_	Тор	of Casing Ele	v.:				
Measurement	of Field Parameters:	Ho	oriba	_	Grou	nd Water Ele	v.:				
	Peristaltic Pump:	Cole Parme	er Masterflex	E/S	Hyd	raulic Locatio	n:				
		Α.	dditional N	lankarlar	Wall Data						
W. II O I'd' /E .'	1		dditional N	_			347.11	. D'	4 * 1		
	dence of Tampering:			Excellent / n	ione		Well	Diameter:	1 inch		
Monitoring Purpose:				04-41-14	V-4 I I	40		44.3			
	27.23			Static V	vater Level:	13.	52	(ft.)			
= Height of Water Column: 13.71 (ft.)  Immissible Layer(s) Present: No.   Mariter Well   Volume /feet   Height of Water   Volume of											
Immiscible Layer(s) Present:     No       Top of Layer:     NA     (ft.)    Monitor Well  Volume/foot Diameter  of Water  Of Water  Column  Water Column  Water Column											
op of Layer:	NA NA	(ft.)									
Bottom of Layer:				1 (in)	0.041 (gal) x		= 0.56				
Thickness:		(ft.)		2 (in)	0.163 (gal) x						
immiscible Layer(s)	Sampled: Not Ap	plicable		4 (in)	0.653 (gal) x	<del>(ft)</del>					
		Monitor	ing Well P	urging and	Sampling	ı Data					
Puraina Device:	Pump		Flow Rate	Time	Water Level	Temperature	рН	Conductivity	Turbidity		
	9:00		(mL/min)	Time	(ft)	(°C)	(S.U.)	(mS/cm)	NTU		
Purging Stop Time:			240	9:00	15.33	15.40	7.12	3.990	Cloudy		
	ns Purged: 1.5		125-150	9:05	14.62	13.40	1.12	3.990	Cloudy		
Well Yield:	13 1 diged. 1.5		123-130	9:20	14.57	16.60	7.26	3.900	Clear		
Sampling Device:	Bailer			9.20	14.57	10.00	7.20	3.900	Cleal		
	Ballot	9:25									
Second Attempt:		am/pm									
Third Attempt:		am/pm									
Fourth Attempt:		am/pm									
Fifth Attempt:		am/pm									
		5	Sample Co	ntainer Info	ormation						
Sample ID	Parameter		tainer	Contair		No. of Co			rvative		
MW-03 MW-03	PAH VOC		nber nber		)mL )As	2	)	Ŋ	IA CL		
WIVV-05	VOC	All	ibei	V C	7/13	2	-	''	CL		
			С	omments							
Samples Shipped to:		nce	Via:			Matt I	Danus				
Form Completed By:	Jamie Berardinelli										
	-										



**	Group	<b>*</b> **								
			Projec	t Informat	ion					
Project #:	-					August 2, 2013				
Site Name:	North Royalton, V	acant Gas	Station			Telephone #:				
MSG Personne	l Present:				JNB					
MSG Personnel Present:  Regulatory Observer(s):					None					
Weather Conditions:	Sur	nny			Ten	nperature °F:		70		
	Field Instrumen	tation				Mor	nitoring We	II Data		
Static Water I	Level Measurement:	Heror	n H.01L	_	Ground	d Surface Ele	v.:			
Immiscible Lay	/er(s) Measurement:			_	Ground Surface Elev.:  Top of Casing Elev.:					
	of Field Parameters:			_		ınd Water Ele				
	Peristaltic Pump: Cole Parmer Masterflex E/S Hydraulic Location:									
Additional Monitoring Well Data										
Well Condition/Evid	lence of Tampering:			Excellent / n			Wel	l Diameter:	1 inch	
Monitoring Purpose:								_		
	27.25		-	Static W	ater Level:	12	.77	(ft.)		
	r Column: 14.48									
Immiscible Layer(s)	) Present: No			Monitor Well	Volume/foot	Height of Water				
Top of Layer:	NA	(ft.)		Diameter	of Water	Column	Water Column			
Bottom of Layer:	NA			1 (in)	0.041 (gal) x	14.48 (ft)	= 0.59			
<del>-</del>	NA	(ft.)		<del>2 (in)</del>	0.163 (gal) x		=			
Immiscible Layer(s)	Sampled: Not Appl	icable		4 (in)	0.653 (gal) x	<del>(ft)</del>	=			
		Monitori	ng Well Pւ	ıraina ənd	Samplin	n Data				
Purging Device:				т:	Vol. Purged		pН	Conductivity	Turbidity	
_	12:50		Well Volumes	Tille	(gal)	(°C)	(S.U.)	(mS/cm)	NTU	
Purging Stop Time:			Start	12:50	(gai)	18.20	7.46	3.510	Cloudy	
	s Purged: 0.5		Otart	1:00		15.70	7.29	3.700	Clear	
Well Yield:	_							000		
Sampling Device:										
Time of Sampling:		10pm								
Second Attempt:		<del>m/pm</del>								
Third Attempt:	а	m/pm								
Fourth Attempt:		<del>m/pm</del>								
Fifth Attempt:	a	m/pm								
		9	ample Cor	ntainer Info	ormation					
Sample ID	Parameter		tainer	Contain		No. of Co	ontainers	Prese	rvative	
MW-04	BTEX/MTBE				DAs TOTAL		2	HCL		
<u> </u>				I .		L		I.		
			Co	omments						
Used Bailer as purging	g device, pump wouldn't	pump wa	ter from well.							
			-			-				
	-				<u> </u>					
Samples Shipped to:	ESC Lab Science	ce	Via:			Matt	Danus			
Form Completed By:	Jamie Berardinelli									



Project Information										
Project #:										
Site Name:	North Royalton, Vacant Gas Station				Telephone #:					
MSG Personne					JNB					
Regulatory Ob	bserver(s):				None					
Weather Conditions:	S	unny			Ten	nperature °F:		70		
	Field Instrume	ntation				Mon	itoring Wel	I Data		
Static Water	Level Measurement:		nn ∐ 011		Ground					
	yer(s) Measurement:			Ground Surface Elev.: Top of Casing Elev.:			v	596.59		
				-	Ground Water Elev.: 581.64					
Measurement of Field Parameters: Horiba Peristaltic Pump: cole palmer					Hydraulic Location: NA					
	- Criotatio i amp.	ooio pairie	/I	-	- IIyu	udilo Eddatio		14/1		
		Α	dditional M	lonitoring	Well Data					
Well Condition/Evi	dence of Tampering:			Excellent / r	none		Wel	Diameter:	1 inch	
Monitoring Purpose:								•		
Total Depth (from TOC):	26.73	(ft.)	<u> </u>	Static V	Vater Level:	14	.56	(ft.)	_	
	er Column: 12.1		)							
	s) Present:		_			Height of Water				
Top of Layer:	NA	(ft.)	)	Diameter	Water	Column	Water Column			
	NA		<u>)</u>	1 (in)	0.041	12.17 (ft)	= 1.98			
Thickness:	NA	(ft.)	<u>)</u>	2 (in)	0.163 (gal) x	(ft)	=			
Immiscible Layer(s)	Sampled: Not Ap	plicable	_							
		Manita	wine Well D		l Camalina	n Doto				
Bt. B. t.	B. 11		ring Well Pu							
Purging Device:			Well Volumes	Time	Vol. Purged	Temperature	pΗ	Conductivity	Turbidity	
Purging Start Time:				40.40	(gal)	(°C)	(S.U.)	(mS/cm)	NTU	
	12:40		Start	12:10		19.80	7.72	3.700	Cloudy	
	ns Purged: 1.00	<u> </u>	2	12:05		18.50	7.46	3.740	Cloudy	
Well Yield:			Final	12:20		16.40	7.34	3.740	Cloudy	
	Dallel	10:00								
Second Attempt:		am/pm								
Third Attempt:		am/pm								
Fourth Attempt:		am/pm								
Fifth Attempt:		am/pm								
	-				l					
		;	Sample Co	ntainer Inf	ormation					
Sample ID	Parameter		ntainer		ner Size		ontainers	Preservative		
MW-05 MW-05	PAH VOC		lmber lmber		OmL OAs	2 2			NA ICL	
				7 67.15						
			C	omments						
Used Bailer as purging de	vice, pump wouldn't pump	water from we	ell.							
Complex Chinaselles FOOLsh Osiones W.										
Samples Shipped to: ESC Lab Science Via: Matt Danus										
Form Completed By: Jamie Berardinelli										



- · · · · · · · · · · · · · · · · · · ·		1.76									
Project Information											
Project #:	C3210006										
Site Name:	North Royalton	North Royalton, Vacant Gas Station				Telephone #:					
	el Present:				Telephone #:						
Regulatory Ol	hearvarie):				JNB None						
Weether Conditions	bserver(s):	IDD1/			Ton	200 CO 1110 OF.		70			
weather Conditions:	S	uririy			. ren	nperature °F:		70			
Field Instrumentation Monitoring Well Data											
Static Water	Level Measurement:	Heror	n H.01L		Ground		_				
Static Water Level Measurement: Heron H.01L Ground Surface Elev.:  Immiscible Layer(s) Measurement: Top of Casing Elev.:											
Immiscible Layer(s) Measurement:      Top of Casing Elev.:       Measurement of Field Parameters:     Horiba     Ground Water Elev.:											
Peristaltic Pump: Cole Parmer Masterflex E/S  Horida  Ground water Elev.:  Hydraulic Location:											
renstante rump. One rannen masternex 1/0 nyuraunt Location.											
Additional Monitoring Well Data											
Well Condition/Evi	dence of Tampering:			Excellent / r			Well	Diameter:	1 inch		
								_			
Total Depth (from TOC):	31.13	(ft.)	-	Static V	Vater Level:	15.	20	(ft.)			
	er Column: 15.9		_				*	()			
	s) Present:		-	Monitor Well	Volume/foot of	Height of Water	Volume of				
Top of Layer:			=	Diameter	Water	Column	Water Column				
Bottom of Layer:			=	1 (in)	0.041 (gal) x	15.93 (ft)	= 0.65				
	NA NA	(ft.)	_	1 (in)	0.041 (gal) x 0.163 (gal) x		= 0.05				
	Sampled: Not Ap		-	2 (in)	, <u>, , , , , , , , , , , , , , , , , , </u>						
illilliscible Layer(s	J Sampleu. Not Ap	plicable	<del>-</del>	<del>4 (in)</del>	0.653 (gal) x	<del>(ft)</del>	=				
		Monitor	ing Well P	urging and	Sampling	ı Data					
Purging Dovice:	pump		Flow Rate	Time	Water Lever	Temperature	pH	Conductivity	Turbidity		
Puraina Start Time:	11:14am		(mL/min)	Tillie	(ft)	(°C)	(S.U.)	(mS/cm)	NTU		
			, ,	44.45			` ,				
	11:32		240	11:15	15.20	23.00	7.21	3.120	Clear		
	ns Purged: 1.0		125-150	11:25	18.37	21.40	7.28	3.010	Clear		
Well Yield:				11:32	18.31						
Sampling Device:											
Time of Sampling:		11:32									
Second Attempt:		am/pm									
Third Attempt:		am/pm									
Fourth Attempt:		am/pm									
Fifth Attempt:		am/pm									
	ı		Sample Co					1			
Sample ID MW-06	Parameter		ntainer	Container Size No. of Co							
10100-00	VOC	Ar	mber	VOAs		2		HCL			
	1			l				<u> </u>			
			r	omments							
			C								
-											
-											
-											
Samples Shipped to: ESC Lab Science Via: Matt Danus											
Form Completed By:	Jamie Berardinelli	Form Completed By: Jamie Berardinelli									